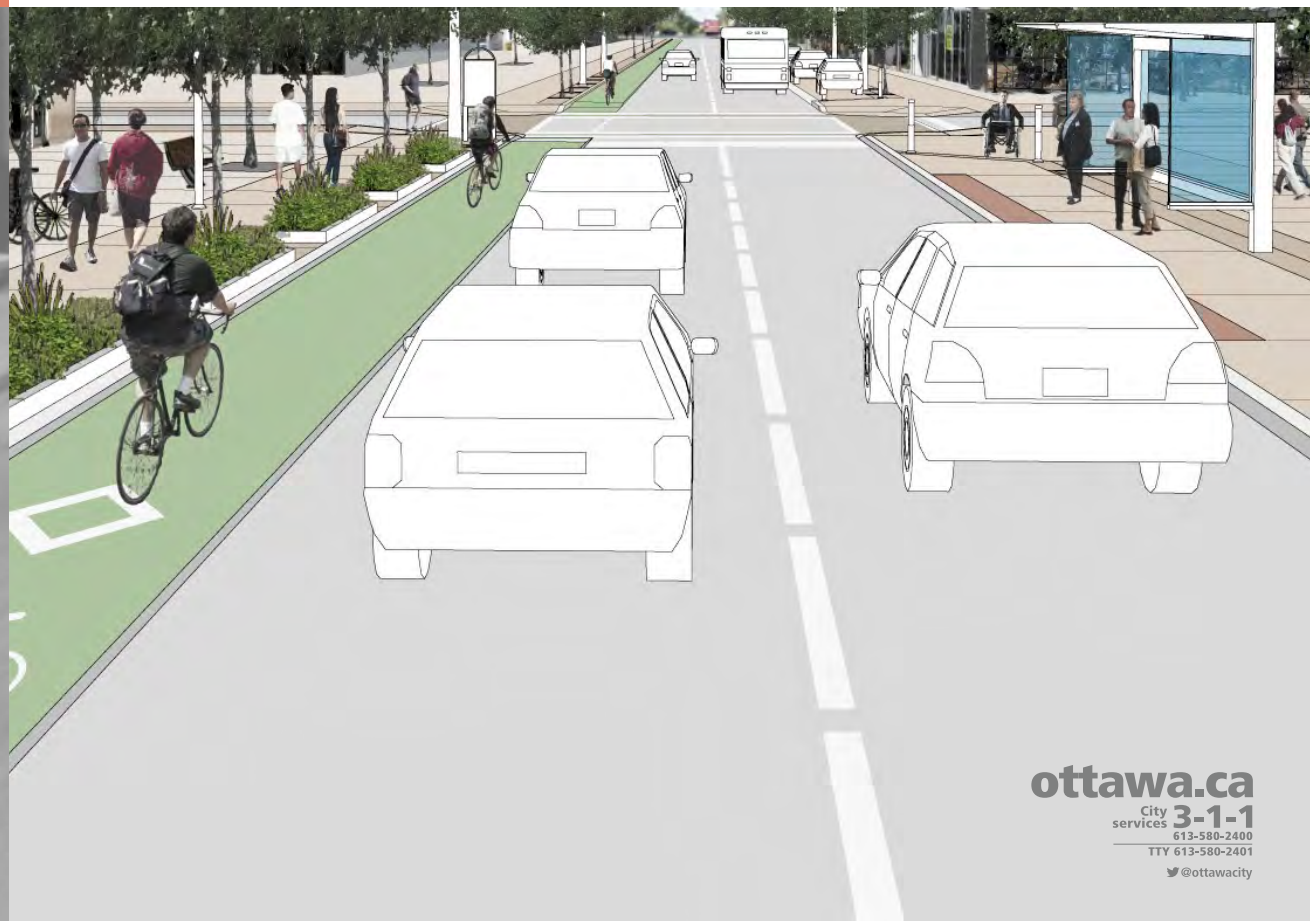
Approved by Ottawa City Council on March 27, 2013

Downtown Moves

Transforming Ottawa's Streets



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Downtown Moves: Transforming Ottawa's Streets

Final Report: Feb 13, 2013

Executive Summary

Downtown Moves is an Urban Design and Transportation Study that identifies ways to create more vibrant, inclusive, safe and accessible streets for residents, workers and visitors of all ages and abilities across Ottawa's Central Business District (CBD). The overall aim is to make walking, cycling and transit use more comfortable and convenient by redistributing and improving the streetscape environment. The Study informs the City on how to best capitalize on the transformative opportunities presented by the implementation of the Confederation Line light rail transit (LRT) project, and seamlessly integrate the future stations at street level.

The Downtown Moves study was undertaken between September 2011 and March 2013 and included several rounds of public consultation. The Study was approved by Transportation Committee on March 4, 2013, with broad public support, and subsequently approved by Council on March 27, 2013.

The construction of the underground LRT will have a transformative impact across the downtown when it opens in 2018. For example, it will alleviate the current bus rapid transit bottleneck on downtown streets and create space that can be reallocated to other street uses and functions. It will change travel patterns of the projected 47,000 morning commuters arriving by LRT who will be seeking new walking routes to their downtown destinations.

As a result of this investment in the LRT, the *Downtown Moves* Study provides innovative solutions to guide a wide range of planning and engineering projects proposed for Ottawa's CBD and its public spaces in order to create complete and safe environments. Specific examples include: widening of sidewalks, provision of pedestrian priority crossing measures, creation of complete cycling networks, creation of Transit Interface Zones for the seamless transfer between different transportation modes, and consolidation of design guidelines to better integrate buildings with the public realm.

Downtown Moves starts with a clear Vision and Strategic Directions that outlines the Study approach and guides the development and evaluation of all aspects of this study. Vision Plans provide additional planning and design analyses of downtown streets organized by the distinct needs of pedestrians, cyclists, transit users, and vehicle drivers. Then, a New Street Design Framework outlines a process to evaluate street design options and identify the preferred solution that is best for the planned function and the adjacent community.

The Street Design Toolkit identifies a range of best practises and creative solutions that are tailored and applicable to the Ottawa context. The best practices are organized into four major mobility modes: *pedestrians, cyclists, transit* and *vehicles* .The section also includes over a dozen Complete Street Design Solutions that rebalance street space among the various uses. *Downtown Moves* also developed pioneering research into the concept of "Pedestrian Level-of-Service" to furthering planning for active transportation in Ottawa.

To assist the community, municipal politicians, business and civic leaders and City staff envision the potential opportunities for change, Street Demonstrations are provided to illustrate innovative and integrated urban design and transportation solutions that could be accomplished on Ottawa's downtown streets.

The Implementation Section of the report identifies:

- Potential streetscape projects that can be implemented incrementally as part of lifecycle renewal over the next five, 10 and 20-year planning horizon;
- 13 "Vital Moves", representing realistic projects or actions that builds on the information and analysis presented in the Study;
- Guidance to amend the City's Official Plan and Transportation Master Plan, as well as the update of the Cycling and Pedestrian plans;
- An implementation program structured around City business practices and departments;
- How *Downtown Moves* fulfills the role of a "Master Plan" as defined in the Ontario Municipal Class Environmental Assessment (2011), to further the Study's rigour and usefulness.

Going forward, *Downtown Moves* will guide the renewal of downtown streets, promoting active transportation, improved urban design conditions and creating an inclusive environment to people of all ages and ability levels.

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1 Introduction

This section introduces the study's background, purpose, objectives, study area and study process of the Downtown Moves study. It also provides a compelling argument associating the revitalization of downtown streets with enhanced prosperity and economic competitiveness of Ottawa's Central Area... a more sustainable downtown and a stronger city.

1.1 Background & Study Purpose

Downtown Moves is an urban design and transportation study that identifies ways to create vibrant, inclusive, safe and accessible streets for pedestrians, cyclists and transit customers by restoring a balance among street users and by improving the streetscape environment, while considering the business and emergency service functions that require access by automobiles. The study informs the City on how to best capitalize on the transformative opportunities presented by the implementation of the Confederation Line (Light Rail Transit LRT) project, and other major infrastructure projects in the downtown.

The City's overall aim is to make walking, cycling and transit more comfortable and convenient to residents and visitors of all ages and abilities, by enhancing the environmental quality of the public realm with streetscape amenities and facilities, as well as allocating the appropriate balance of surface space within the network of street rights-of-way downtown. Downtown Moves also examines ways to seamlessly integrate the future Confederation Line stations at street level and provides a framework to guide a wide range of planning and engineering projects proposed for the downtown.

The study builds upon the guidance provided in the City of Ottawa *Official Plan*, the recommendations in the 2004 *Downtown Ottawa Urban Design Strategy*, the City's *Transportation Master Plan*, *Pedestrian Plan* and *Cycling Plan*, and a host of other studies and projects.

Moreover, City Council understands that a prosperous, efficient and resilient city is one that embraces walking, cycling, and transit use as priority travel modes. A more walkable, liveable and sustainable downtown will also be more economically competitive over the long term. This theme is echoed in the City's Official Plan and in the guiding principles of Choosing Our Future, the long term plan for the Nation's Capital.

Previous Related Studies in Immediate Context of the Study Area

- Choosing Our Future (City of Ottawa), 2012
- Rideau Street Vision Statement and Guiding Principles (City of Ottawa), 2011
- Rideau Street Urban Design Study (City of Ottawa), 2007
- Downtown Ottawa Transit Tunnel (DOTT) (City of Ottawa), 2011
- Ottawa Light Rail Transit (LRT) (City of Ottawa), Ongoing
- Downtown Ottawa Urban Design Strategy (City of Ottawa), 2004
- Centretown Community Design Plan (City of Ottawa), 2012
- Escarpment District Community Design Plan (City of Ottawa), 2008
- Segregated Bike Lane Pilot Project (City of Ottawa), 2011
- King Edward Avenue Lane Reduction Study (City of Ottawa), Construction nearing completion
- Municipal Parking Management Strategy (City of Ottawa), 2009
- Integrated Street Furniture Program (ISFP) (City of Ottawa), 2009
- Bronson Avenue Reconstruction (City of Ottawa), Scheduled to be rebuilt in 2012-2013
- Ottawa Pedestrian Plan, as part of 'Ottawa On the Move' (City of Ottawa), 2009
- Carling-Bayview LRT Corridor CDP (City of Ottawa), Ongoing
- Horizon 2067: The Plan for Canada's Capital (NCC), Ongoing
- Capital Urban Lands Master Plan (NCC), Ongoing
- Canada's Capital Core Area Sector Plan (NCC), 2005
- Sparks Street Mall Vocation Study (NCC), Ongoing
- Urban Design Study: Sussex Drive, Rideau Street and Colonel By Drive (NCC), 2009

This report identifies potential changes that can help restore the balance among all street users in downtown Ottawa. It is composed of the following sections:

- Section 1 explains the background, purposes and objectives of the study;
- Section 2 introduces a New Street Design Decision-Making Framework, provides the Vision, Strategic Directions, Plan of Streets and Vision Plans that will help guide the redesign of Ottawa's downtown streets;
- In Section 3, a comprehensive Street Design Toolkit and Complete Street Design Solutions are provided, detailing guidelines specific to improving the downtown environment for pedestrians, transit customers, cyclists and other visitors;
- Section 4 provides the Vital Moves and Demonstrations of the ideal end-results for the streets in downtown, highlighting potential physical projects to enhance the safety, mobility and quality of the urban environment downtown;
- In Section 5, an Implementation Strategy is provided to help the City of Ottawa and its stakeholders achieve the end results; and,
- The Appendices provide background and detailed analysis of Ottawa's downtown conditions, including: policy framework, existing conditions, street right-of-ways, pedestrian level-of-services, and others.

1.2 Confederation Line

Ottawa's Light Rail Transit project, known as "Confederation Line" is an estimated $2.1 billion dollar investment to upgrade Ottawa's transit system and scheduled to begin operations in 2018. It will provide an opportunity to enhance mobility in downtown Ottawa for pedestrians, cyclists and transit customers. In this context, and in response to several Council resolutions and reports, the Downtown Moves Study emerged in order to co-ordinate urban design at the street level with the transit station locations for the Confederation Line project. Some of the Confederation Line project highlights, as directly related to the Downtown Moves Study, include:

- The underground light rail tunnel will alleviate the current bus rapid transit bottleneck downtown and create opportunities for a more inviting downtown streetscape;
- Three downtown Confederation Line stations will be created, as shown in Figure 1-1. These include Downtown West Station (Queen Street between Lyon and Kent Streets), Downtown East Station (Queen Street at O'Connor Street), and Rideau Station (Rideau Street between Colonel By Drive and William Street);
- There will be a reduction in the number of OC Transpo downtown surface buses, from approximately 2,600 to 600 daily buses;
- There will be an opportunity to recreate Queen Street as a pedestrian-priority transit corridor; and,
- Bus volume on Albert Street, Slater Street, and the Mackenzie King Bridge will be significantly reduced, which may open opportunities on these streets for a new vocation. The new vocation for these streets is introduced in Section 2 of this report and is one that promotes active transportation and improved urban design conditions, creating an inclusive environment to all age groups and ability levels.

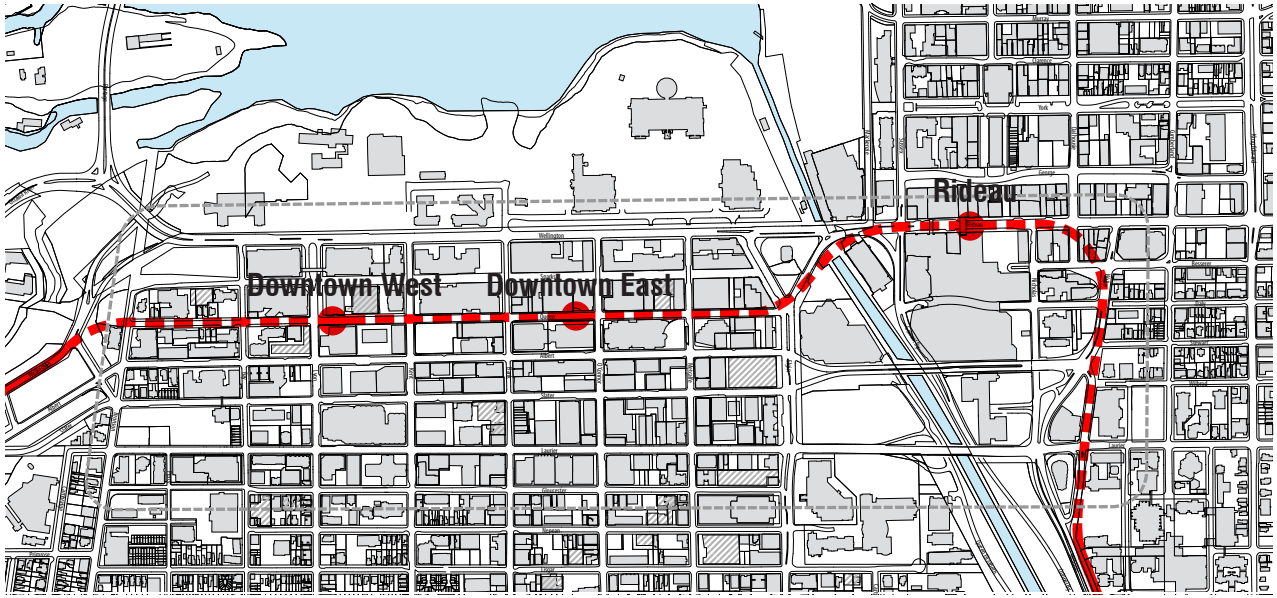
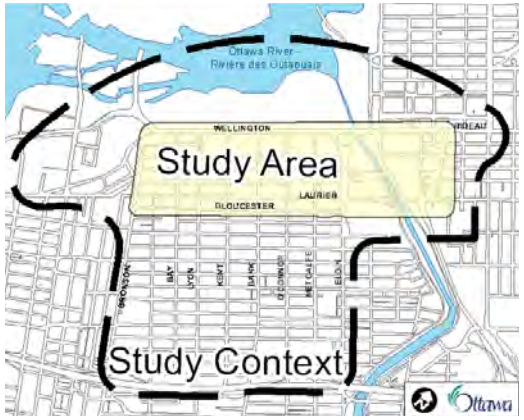


Figure 1-1: Proposed Future Light Rail Transit Stations in Downtown Ottawa

The primary **Study Area** is the Central Business District of the Central Area (north of Gloucester Street, between Bronson and the Rideau Canal), and including a portion of Rideau Street, the Rideau Centre, and the Ottawa Convention Centre. This area captures the three planned OLRT stations in downtown Ottawa - Downtown West Station, Downtown East Station, and Rideau Station.

The broader **Study Context** includes the surrounding areas of the downtown (Mid-Centretown, the Escarpment District, Rideau Street, the Parliamentary Precinct, as well as portions of the University of Ottawa, the Byward Market and LeBreton Flats). These areas have been the subject of many past, on-going and recently completed plans, projects, and strategies.

The study limits are illustrated in Figure 1-2.



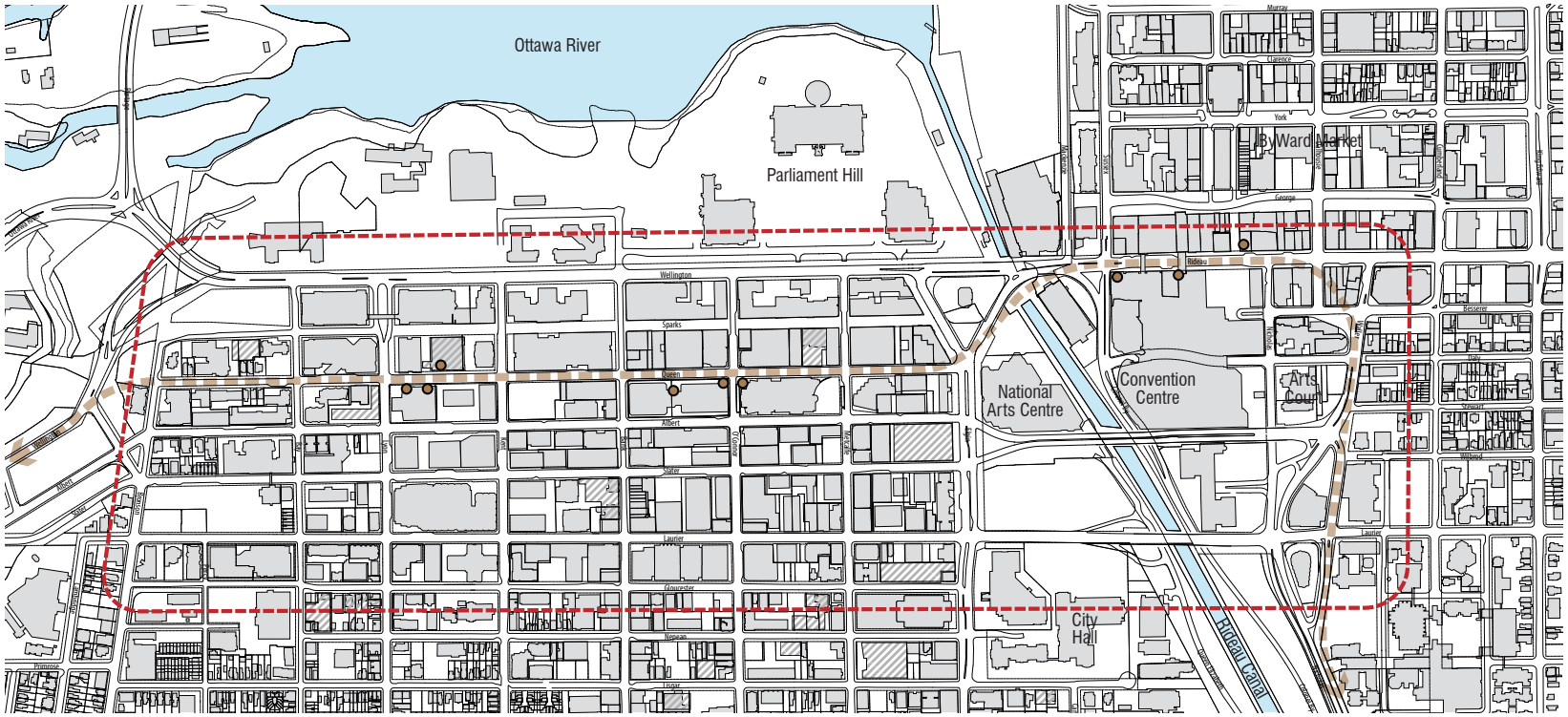


Figure 1-2: Study Area and Study Context

1.4 Study Objectives

The overall purpose of the study is to complete an open and consultative planning and design process that produces an integrated urban design and transportation strategy for the future of downtown Ottawa's street network, leveraging the opportunities to connect at the street level with the three proposed downtown Confederation Line stations. The strategy pursues a spatial and functional balance among street users that is in keeping with the City's desire for its streets to be highly coveted public spaces as well as effective mobility routes conducive to active transportation and transit as priority modes. The study promotes some innovative "moves" that the City can pursue in downtown Ottawa.

The key tasks are:

- **Study Area Conditions:** To study the land use, urban design, transportation and environmental policies, physical conditions, projects, opportunities and constraints that will inform the range of integrated urban design and mobility solutions to be evaluated.
- **Discover Best Practices:** To research and draw from the body of knowledge associated with transforming the downtowns of other cities into more walking, cycling, and transit-oriented areas through integrated urban design and transportation solutions, highlighting those applicable to the Ottawa context.
- **Coordinate with Other Studies, Projects and Investigations:** To identify other relevant projects and studies in the downtown and to draw together the proponents to dialogue, to explore common objectives, and to integrate activities where appropriate.
- **Propose Strategic Mobility and Design Framework:** To re-imagine downtown Ottawa's network of connected streets, routes, buildings and public spaces that achieves a desirable urban character and a balance that favours walking, cycling and transit use, having regard for the future LRT stations and associated at-grade opportunities and changed transportation flows.
- **Recommend Design Solutions:** To provide a suite of specific street design solutions that will enable the City to "build out" the recommended mobility network, including a recommended set of potential projects and methods to implement.
- **Provide Implementation Strategy:** To provide a strategic implementation framework that will be a road map for the City and stakeholders to follow towards the actual construction of the mobility network, as well as guiding associated activities of other agencies and the private sector including recommendations for subsequent designs or studies.
- **Provide Collaborative Study Process:** To deliver the study products within an open and collaborative process that enables the understanding by, and endorsement of, elected officials, City staff, and a wide range of community, business and agency stakeholders.

1.5 Environmental Assessment Considerations

One of the outcomes of the *Downtown Moves* study is to identify potential capital projects. Some of those projects may be subject to the 2011 Municipal Class Environmental Assessment (EA) process. The Municipal Class EA is an approved planning document that describes the process that proponents must follow in order to meet the requirements of the Environmental Assessment Act. Projects are categorized as either Schedule A, B, or C, according to their environmental significance and the effects on the surrounding environment. Examples would include:

- Streetscaping not part of another project (Schedule A+);
- Construction of localized improvements (Schedule A);
- Road side park (Schedule A); and,
- Reconstruction or widening where the reconstructed road or other linear paved facilities (e.g. HOV lanes) will not be for the same purpose, use, capacity or at the same location as the facility being reconstructed (e.g. additional lanes, continuous centre turn lane (Schedule B if <$2.4 m, Schedule C if >$2.4 m).

The study has been undertaken as a "Master Plan" to address the initial phases of the Class EA process as defined in the Municipal Class Environmental Assessment as amended in 2011. In conducting the EA, two approaches were considered:

Approach 1 – The Master Plan would be done at a broad level of assessment thereby requiring more detailed investigations at the project-specific level in order to fulfil the Municipal Class EA documentation requirements for the specific Schedule B and C projects identified within the Master Plan. No opportunities for Part II Order requests for either the Master Plan or individual projects.

Approach 2 – The Master Plan document would be produced at the conclusion of phases 1 and 2 of the Municipal Class EA process where the level of investigation, consultation and documentation are sufficient to fulfil the requirements for Schedule B projects. Any Schedule C projects, however, would have to later fulfil Phases 3 and 4 prior to filing an ESR(s) for public review. The Master Plan itself is not subject to Part II Order request opportunities but the projects identified within them are.

Given that the primary purpose of the Downtown Moves Study is to provide a strategy, design guidance, and general direction for future projects, the second approach was utilized.

Section 5 of this report provides an Evaluation of Street Network Alternative Solutions.

The overall work approach to this study was based on a philosophy of teamwork, involving City staff, the consulting team and stakeholders. It was also very important to maximize work productivity, encourage decision-making and tap into specialized expertise when needed. To this end, this study adopted a work structure that divided participants into three groups: *Project Management Committee*, *Downtown Moves Working Group* and the *Downtown Moves Resource Team*. This was used as the platform for broader public involvement.

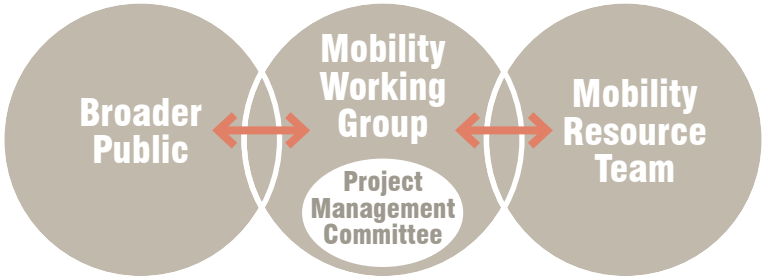


Figure 1-3: Communication Structure

Project Management Committee

The *Project Management Committee* (PMC) kept the City informed, addressed outstanding issues, made design decisions, discussed study strategy and monitored the scope of the work. This committee was composed of the City's study project manager, other key City staff, and lead members of the consulting team.

Downtown Moves Working Group

The *Downtown Moves Working Group* assisted the City in advancing the study, providing input and solutions to issues. This group also relayed information back to their individual organizations and, conversely, brought questions/concerns from their organizations to the Working Group. This was the primary consultation group that helped to guide the study, and included representation from Ward Councillors, key City branches, other government agencies such as the National Capital Commission (NCC) and Ontario Ministry of Transportation (MTO), area Business Improvement Areas (BIAs), Community Associations, special interest groups, land owners and other groups.

Downtown Moves Resource Team

The *Downtown Moves Resource Team* was formed to capture a broad group of potentially interested persons and to address the full range of technical matters and special interests pertaining to the study. Individuals from the Resource Team were provided the opportunity to comment on study initiatives and deliverables and to provide technical and/or unique knowledge and advice at key decision points throughout the study, as required by the *Downtown Moves Working Group*.

The Team was not required to attend study meetings, but rather, formed a resource pool from which the *Downtown Moves Working Group* and study managers drew upon to help inform the study and work through issues that arose. Communications largely were through electronic means, including email circulation/review of study deliverables. The Team was also a medium for collecting and disseminating information and responses pertaining to study activities.

Broader Public Involvement

The Downtown Moves study consultation process was carried out in accordance with the City's Public Notification and Consultation Policy. Public feedback was gathered throughout the process using comment sheets, e-mail, telephone, website blogs and face-to-face conversations. Extensive advice and comments were provided and no objections to this study were made.

The consultation process was carried out from August 2011 to February 2013 and involved various strategies to engage the public, including a Mobility Summit, a project webpage (www.ottawa.ca/downtownmoves), a project e-mail list (consisting of over 300 people), individual meetings and presentations at related forums and at various City committee meetings. Notification for the public events was advertised using the project e-mail list and via local (the Metro) and daily (Le Droit) newspapers at least two weeks in advance of the event.

In sequential order, the following consultation events took place:

- The first Working Group Meeting took place on October 4, 2011, and informed the stakeholders of the study's objectives, goals and outcomes. Participants contributed to determining the study area and detailed objectives of Downtown Moves. This event was followed by a walking tour of downtown Ottawa with members of the Working Group and the Project Team on October 5, 2011.

- A Mobility Summit took place on November 2-3, 2011, and brought together national and international experts, community leaders, municipal staff and stakeholder agencies to listen and share their experiences. Three public lectures by keynote speakers Gil Peñalosa (8-80 Cities), Andrew Wiley-Schwartz (New York City Department of Transportation), and Ken Greenberg (Greenberg Consultants Inc.) attracted more than 400 people who had the opportunity to interact with the speakers, City staff and the Project Team, and to learn more about the study.

- A day-long workshop on November 3, 2011, was attended by approximately 50 stakeholders from various City branches and government agencies, as well as business/community organizations and special interests. The participants worked collaboratively to discuss the study and provide input.

- The second Working Group Meeting took place on December 6, 2011, and generated discussion regarding the Vision, Principles and Design Directions for Downtown Moves. In this meeting, members of the Working Group also provided feedback about the preliminary list of "moves" to take place in Downtown Ottawa and on the preliminary Design Framework.

- The first Public Open House took place on January 18, 2012. Approximately 75 participants attended the event and had the opportunity to learn more about the study's objectives, strategic directions and how to become involved. Participants also had the opportunity to engage with the Project Team and provide their comments on how to restore a balance among street users in downtown Ottawa. A Newsletter was provided at that time.

Figure 1-4: First Downtown Moves Workshop

- The second workshop was held on April 19, 2012. Approximately 30 members of the working group and resource team participated in the workshop and provided input regarding the vocation of streets in downtown Ottawa and commented on draft street cross-sections for: Albert, Slater, Queen, Metcalfe and Wellington streets.

- The third Working Group Meeting took place on May 29, 2012. In this meeting, participants were introduced to a new Street Design Approach, a Plan of Downtown Streets and five supporting Vision Plans - Functional Overlay maps. The stakeholders were able to provide feedback during the meeting as well afterwards via email and telephone.

- The second Open House took place on June 13, 2012 and was attended by approximately 65 participants. The main goal of this Open House was to introduce the new Street Design Approach, Plan for Downtown Streets and five supporting Vision Plans- Functional Overlay maps. Using the elements provided in the Functional Overlay Maps, before-and-after images for the downtown streets were presented.
- The last Working Group Meeting took place on November 28, 2012 and was attended by 33 participants. Members of the Working Group discussed the Implementation Strategy, Review of the Pedestrian Easement Policy, One-way to Two-way Street Conversion Memorandum and provided feedback on the overall structure of the Downtown Moves report.
- The final Public Open House took place on January 17, 2013.
- In addition, two presentations to the Urban Design and Review Panel (UDRP) of the City of Ottawa, various individual stakeholder meetings with City of Ottawa staff and associated community organizations were held throughout the study timeline.
- Project information pamphlets for each of the Open Houses were provided and made available online.

The City of Ottawa and its consulting team extend a special thank-you to the members of the working group, resource team and participants from the broader public who volunteered their time to this project and provided important feedback to the Downtown Moves study.

Figure 1-5: Final Public Open House

Figure 1-6: Urban Design Review Panel Presentation

1.7 Downtown Aspirations

The study process provided an opportunity for a year-long, city-wide discussion about the future of downtown Ottawa. From this dialogue, and from the urban design and transportation analyses that informed it, a picture emerged in regards how the Confederation Line project can ignite a transformation of the downtown. The images below and on the following page illustrate some of the most important aspirations that are shared by many. Some of these build on themes already expressed in the City's *Downtown Ottawa Urban Design Strategy* (DOUDS), and some new themes are presented. These aspirations are a helpful starting point for charting a new vision for downtown Ottawa, and developing a new urban design and transportation framework for moving forward.

Throughout the public consultation strategy undertaken for Downtown Moves, the stakeholders involved in the process identified opportunities to create a more desirable downtown. Recurring issues included:

We need more green space especially in the western end!

Sidewalks are too narrow in some city blocks!

We would like to have more access to mid block connections!

(image source: CC Flickr user melanieandjohn)

(image source: CC Flickr user Xiaozhuli)

Bring more life to Sparks Street

All the multi-lane one-way streets lead to faster driving speeds

We need better pedestrian links between ByWard Market & Downtown

We need more north-south cycling routes

Businesses need to retain access to on-street-parking, loading and taxi areas

Downtown is too dull at night and on the weekend!

(image source: CC Flickr user Sebastien_)

We need better cycling connectivity from east and west ends of downtown

(source: © 2012 Google)

1.8 Case for Making Moves in Downtown Ottawa

As with any city, the social, cultural and economic success of Ottawa's downtown will always be a barometer of the success of the entire city. The measure of success is a continually evolving exercise and with ever-changing indicators. The pursuit of success involves careful attention to city planning and requires considerable investment, and from time to time will benefit from intervention. In the case of downtown Ottawa, the Confederation Line is a timely intervention that will change the urban landscape and will raise the bar in regards how success is measured. This notable investment of all levels of government is being made in lock-step with various other trends and initiatives that are being experienced by major cities in North America in regards to urban/transportation planning, and the design of downtown streets as safe and "complete streets". Some considerations are described below.

Downtown Ottawa is an Economic Driver

Downtown is a major contributor to Ottawa's overall economic vitality despite representing only 0.9% of the urbanized area or 0.1% of the entire area of the City of Ottawa. As documented in the *City of Ottawa Annual Development Report*, September 2012, the Commercial Business District (CBD) alone (includes portions of the study area west of Elgin Street) accommodates 43% of the City's commercial office space, or 1.44 million m^2 of space, with vacancy rates at 5% to 7% being amongst the lowest in any major North American City. The Central Area as defined in the Official Plan (includes portions of the ByWard Market which are outside of the study area) produces over 100,000 jobs, and jobs are forecast by the City's Planning and Growth Management Department to grow to approximately 125,000 by 2031. Downtown employment will continue to be anchored by the federal government which has stated that it will maintain downtown Ottawa as one of its primary nodes of office accommodation in the National Capital Region. It is also the social and cultural heart of the City and has numerous attractions of national and international caliber. This intense economic activity, and ongoing private sector contribution, supports a case for investment in the quality and level of service of downtown Ottawa's streets and public spaces.

Downtown Ottawa is an Emerging Residential Address

Whereas a population of just 10,900 reside in the Central Area today, there has been a surge in residential development activity in the central area over the past few years. The population of Ottawa's Central Area is forecast to grow to 20,000 residents by 2031. The City reports that the area grew by an additional 1,500 residents in the period 2007 to 2011 alone. This means residential floor space is projected to increase from 371,600 m^2 (2001) to 1.11 million m^2 (2031). The downtown population is diverse in both age and ethnicity, with one quarter of residents being in their twenties, and one-quarter being international migrants, as reported by the Canadian Urban Institute in its report, *The Value of Investing in Canadian Downtowns*, 2012. This young, diverse and urban demographic that is less car dependent and will support a burgeoning market for active transportation and transit and support the case to develop complete streets that are inclusive for all users, of all ages and abilities.

Downtown Ottawa is Becoming Less Car-Reliant

The City's Transportation Master Plan (TMP) has established a sustainable transportation vision for downtown Ottawa that foresees decreasing reliance on the private automobile as a mode to move within or through the area. This is based not only on vision, but anchors onto trends. Between 2005 and 2011, automobile morning-peak modal share of trips to downtown Ottawa dropped from 34% to 29% while the transit modal share increased from 45% to 51% (2011, Origin-Destination Survey, City of Ottawa and R.A. Malatest/HDR/David Kriger). In 2011, approximately 76% of the recorded daily (24-hour) trips which originated and ended within the Ottawa Central Area were non-motorized trips (28,000 total daily trips by all modes). In 2031, with Confederation Line having been in operation for nearly 15 years, there will be an additional 16,450 inbound transit trips during the morning peak hour to the Ottawa Inner Area (City of Ottawa, Rail Implementation Office, 2012). Over the same time, only 1,450 additional automobile trips are forecast. This supports a case for increasing capacity and level of service for walking and cycling in downtown area, while maintaining an appropriate level of service for automobiles.

Downtown Ottawa Can Set the Example for Active Transportation, Safer and Healthy Communities

The links between public health and transportation have been well studied in recent years by agencies such as Health Canada and the Canadian Heart and Stroke Foundation. These agencies report that three-fifths of adult Canadians are considered overweight or obese, and one-quarter of Canadian children and youth falling into the same category. Obesity is linked to other health care concerns including diabetes, heart disease, and stroke, all of which can be linked to rising health care costs. Obesity rates have been increasing for the last thirty years, and evidence has shown that the risk of obesity decreases notably for every kilometre walked per day, and rises with each hour spent in a car per day. It is clear that Ottawa's investments in regards to complete streets and active transportation infrastructure and the resulting improved overall community livability and health, will reap the greatest benefit in the most highly populated areas such as downtown Ottawa, and this is the ideal location to showcase some moves.

Downtown Ottawa Streets Warrant Strong Municipal Investment

Ottawa's downtown area properties contribute approximately 18% of the municipality's approximately $1.37B property tax revenue (2013 budget, http://ottawa.ca/en/presentations). This is according to a comparative study published by the Canadian Urban Institute (The Value of Investing in Canadian Downtowns, 2012), which included the entire "Central Area", which includes portions of Lowertown, Centretown, Lebreton Flats, and Sandy Hill that are in addition to the study area. There are approximately 30 km of municipal streets in the study area generating municipal tax revenues at a significantly higher rate than other streets across the city. This supports a very strong case for long term investment in Ottawa's downtown streets, in terms of both capital and operating expenditures ... a case for making moves.

Downtown Ottawa Streets Efficiently Moving More People, in a Safer and Sustainable Manner, in the Same Space

Currently, during the weekday morning peak period, it is estimated that travel to, from and within downtown Ottawa is comprised of 28,710 people using 22,810 cars, 36,020 people using transit, 2,590 people using bicycles, and 8,340 people travelling by foot (2011 TRANS Origin-Destination Survey Report). A significantly larger proportion of people travel to, from and within downtown Ottawa using sustainable means of transportation rather than private automobiles. And yet, the space allocated to vehicles far exceeds the space available on sidewalks for pedestrians, and on the road for buses and bicycles. As downtown streets and parking areas are functioning near capacity, little growth for this mode is possible, and future travel demand must therefore be accommodated by transit, walking and cycling. The new Confederation Line will allow for a doubling of rapid transit capacity through downtown Ottawa, while actually removing the requirement to accommodate this demand on downtown streets, freeing up the road space for potential pedestrian and cycling enhancements.

Following the opening of the Confederation Line, there will be significant new demand for pedestrian space, particularly in the vicinity of station entrances. The total number of people projected to be entering or exiting the three downtown stations by the year 2021 is 46,840 (weekday morning peak period) (source: Transit Services Department, OC Transpo). While transit users will form the majority of pedestrian activity downtown, even auto drivers and passengers become pedestrians for part of their journey within the downtown area. Considering the massive growth anticipated in active transportation use necessary to support continued growth and activity in downtown Ottawa, the constrained rights-of-way in downtown Ottawa can be more efficiently used if space is allocated to accommodate pedestrians, cyclists and transit customers rather than private vehicles.

Downtown Ottawa Streets are Public Places

As they cross at the heart of the nations' capital, streets in downtown Ottawa represent one of the largest most populated public spaces in the Central Area, offering a tremendous opportunity to create vibrant, accessible people-oriented place-making that promotes vitality, well-being, safety and an increased sense of community. Although currently used as circulation routes for over 100,000 workers and 7.8 million tourists, downtown Ottawa streets can be redesigned as more welcoming places of interaction where people of all ages and abilities can access businesses, institutions, as well as recreational and cultural activities that contribute diversity and distinctiveness to our surroundings and create a more comfortable streetscape experience. This fundamental vocation for downtown Ottawa streets, addressed in the Downtown Moves Study, establishes the framework that supports downtown Ottawa as a setting for a lively, world-class, Capital City. Downtown Moves supports a variety of previously approved plans and policies, including the *Official Plan*, *Downtown Ottawa Urban Design Strategy* (2004), *Centretown Community Design Plan* (2013), and the National Capital Commission's *Plan for Canada's Capital*.

In summary, the investment in the Confederation Line is the foundation for a case to pursue the city's aspirations for a renewed and successful downtown street environment. When coupled with the cumulative economic, social, and cultural considerations, the case is very strong for incremental, yet game-changing moves to be made. The Downtown Moves initiative will build on this foundation by promoting healthier, safer, attractive and more sustainable street transportation to, from and within the heart of the Nation's Capital, via a network of successful complete streets.

2.1 A New Street Design Decision-Making Framework
2.2 Vision
2.3 Strategic Directions
2.4 Plan of Streets
2.5 Vision Plans: Mobility Overlays

2 Vision for Downtown Ottawa Streets

Building on the aspirations for downtown Ottawa, this section provides the framework for a new decision-making and street design approach, followed by the Vision, Strategic Directions, Plan of Streets and Vision Plans that will guide the planning and design of Ottawa's downtown streets and the buildings and public spaces along them.

2.1 A New Street Design Decision-Making Framework

The City of Ottawa is responsible for designing, constructing, operating, maintaining, and reconstructing its city streets within City-owned right-of-ways. The City also collaborates with the NCC in the design and construction of Confederation Boulevard which is an important element in downtown Ottawa. The municipality is also responsible for issuing development approvals under Ontario's Planning Act for developments on abutting private land. When creating great streets in downtown Ottawa, the care and diligence afforded to each activity is as important as the other. It is vitally important that the planning and design objectives for each are harmonized, and that there is a shared understanding of the objectives by the street designers (planners, engineers, landscape architects and architects), street users, and decision-makers.

Although space available for City street-building and place-making is scarce (many street rights-of-way are as narrow as 18m, making them amongst the narrowest streets in Canada), streets are one of the largest public spaces in Ottawa. At the same time, there are many competing interests for horizontal space, including sidewalks, bus stops/shelters, landscaping, public art, bicycle parking, vendor boxes, street lights, fire hydrants, on-street parking, and travel lanes. Given the intensity of use and the increase in intensity that is envisioned with the investment in light rail transit downtown, decisions regarding the allocation of space are anticipated to become more complex.

On this basis, a new framework is required to guide future decision-making on the design of downtown streets. The foundation of the new framework is the acknowledgement that *the status quo is not an option* in regards the quality of the

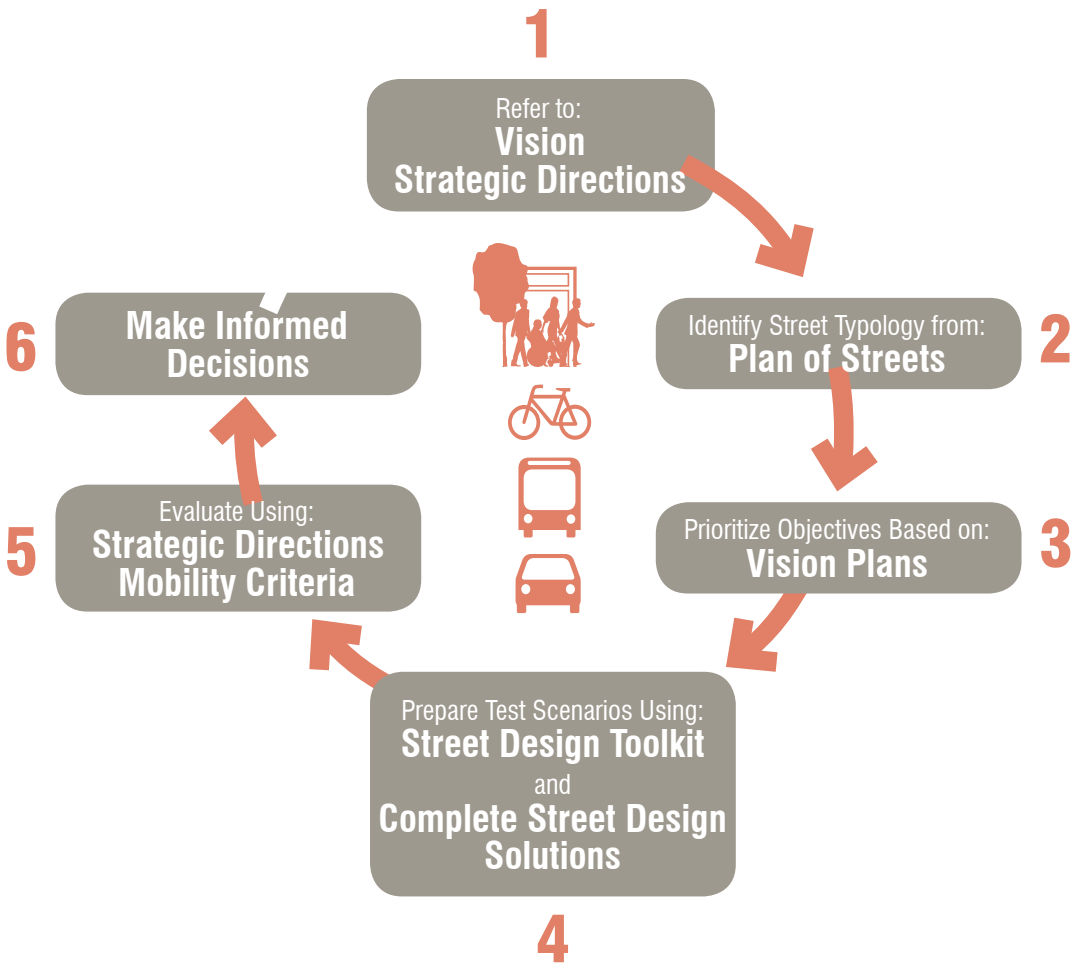


Figure 2-1: A New Design Framework for Making Moves

urban environment at street level in downtown Ottawa, and the allocation of space amongst street users. The clear mandate is for improvement ... and making some moves. With that acknowledged, a new framework has been developed to guide design decision-making. The framework is supported by: a new vision, strategic directions, plan of streets, and vision plans in the form of street renewal choices. A street design toolkit, complete street design solutions and a series of design demonstrations are provided. These inter-connected aspects of the framework are provided in sections 2, 3 and 4.

Figure 2-1 illustrates how the elements of this framework work together to create a design decision-making process. Each step is described as follows:

Step 1: Refer to the Vision & Strategic Directions

For a street design exercise involving a street in Downtown Ottawa, the first step in the process will be to imbed the Downtown Moves Vision and Strategic Directions within the terms of reference of the project (as presented in Sections 2.2 and 2.3). This will ensure that the street design team, including municipal asset management and infrastructure services staff are well informed of the special design objectives applying to streets in downtown Ottawa.

Step 2: Identity Street Type from the Plan of Streets

The second step will be to confirm the street type from the Plan of Streets (as presented in Section 2.4). This will establish the street-specific function for the street and help determine the relative importance of the strategic directions.

Step 3: Prioritize Street Design Objectives Based on the Vision Plans: Mobility Overlays

This step will involve a careful analysis of the Vision Plans: Mobility Overlays (as presented in Section 2) applying to the street, in the context of the Plan of Streets. This analysis will provide a general street theme as well as specific guidance on many details to be addressed, including the urban design focus and route priorities for pedestrians, cyclists, transit vehicles, and other vehicles requiring access.

It is certain that there will be competing interests for space amongst the various stakeholders involved, including City branches, other agencies, and community/business representatives. It is imperative that a "Street Design Working Group" be established to work together and pursue a shared understanding of the value and importance of the various overlay components. Street design objectives will be confirmed. Technical and public stakeholders will work together as a group towards this important goal.

Step 4: Prepare Options Using Street Design Toolkit & Complete Street Design Solutions

Once the design objectives have been established, the street design team will proceed to prepare options for discussion. The development of options will be informed by the design toolkit and complete street design solutions provided in section 3. The options will demonstrate different ways to achieve the objectives, perhaps with greater emphasis put on one objective over another. This will enable stakeholders to see the street design challenges and help provide or evaluate solutions to resolve the competition for space.

Step 5: Evaluate Using the Strategic Directions and Mobility Criteria

Street design options will be evaluated against the Strategic Directions and Mobility Criteria (as presented in Section 3.1), which also will act as evaluation criteria whenever Environmental Assessment (EA) is required. It is important to note that some criteria will have a quantitative measure (such as level of service) whereas other criteria will have qualitative measures (such as quality of experience). Although evaluated on different scales, the two types of measures will be equally relevant. Recommendations on preferred designs will benefit from the technical evaluation however the more important aspect will be dialogue. Stakeholders with certain values will be given the opportunity to learn from others with differing values. In the end, the street design team will recommend a functional design considering the input provided, and will use the Vision and Strategic Directions to make final determinations where consensus cannot be reached.

Step 6: Make Informed Decisions

Following the study team's recommendation on a preferred functional design, the project can proceed to detailed design. Since it is often the details of design that are required to answer design challenges, the Street Design Working Group will continue to guide the design process. In situations where there are divergent views on the preferred functional design, and where a decision is difficult for the team to make unilaterally, the decision will be made having regard for the following criteria:

The street design choice will be favoured that:

1. Best enables the planned function of the adjacent community and properties to be achieved; and,

2. Best provides for the most efficient use of the right-of-way, measured as the highest ratio of mobility-to-space (travellers per square metre per hour).

In cases where decisions cannot be made through evaluation and dialogue, the choice can be taken to an existing committee of Council (either Planning or Transportation Committee). This decision will then provide a clear direction to advance to detailed design. Any presentation to a Council committee will make reference to the Vision, Strategic Directions and Plan of Streets, as well as the Vision Plans: Mobility Overlays.

2.2 Vision

Our downtown is about to undergo a transformation that will define a new identity and be the foundation for its prosperity for coming generations. The investment in the Confederation Line will commence and sustain a new pursuit of civic and national pride in the urban quality of our capital city. Our downtown streets will be re-oriented to favour and comfort pedestrians, cyclists and transit customers, recognizing all travellers, of all ages and abilities. With this safe, healthy and active orientation, our streets themselves will be praised as among our city's most coveted public spaces that in turn spark investment and that are befitting of the highest quality of buildings and open spaces along them.

2.3 Strategic Directions

Strategic Directions

The Strategic Directions establish the Downtown Moves Study philosophy and guide the development and evaluation of all aspects of the Study. They were built based on consultations with stakeholders as described in Section 1 of this document.

Our downtown Ottawa streets and public spaces will be:

Confederation Line Focused

We will plan and design our downtown streets to integrate with, and capitalize on, the investment in light rail transit by maximizing the ease of mobility of people of all ages, abilities, genders and social status moving to and from the downtown rapid transit stations as well as the quality of that experience. We will do this by paying extra attention to the pedestrian spaces and cycling facilities serving the station entrances and the sidewalks and crosswalks within proximity.

Rebalanced, Equitable & Inclusive

We will increase the amount and quality of space on downtown street right-of-ways that serve pedestrians, cyclists and transit customers, recognizing the increasingly important role of these modes over time in accordance with current policy direction. Public spaces will be inclusive and allow for people of ages and abilities to enjoy them. We will do this by making decisions on street design, space allocation, and operation that address the needs of pedestrians (including transit customers) and cyclists as our first priority, followed by all other vehicles. The need for emergency service vehicles to move and serve downtown must always be considered.

Efficient, Flexible & Affordable

We will make the most efficient use of all our streets. We will do so by pursuing the flexible and resourceful use of the right-of-way (such as shared spaces) and by identifying and re-programming under-utilized space while having regard for time of day, seasons, and special event opportunities, and by delivering streets that are affordable to construct and maintain over their life-cycle.

Capital Public Space

We will consider our downtown streets as amongst our capital city's most important public spaces. We will do so by pursuing a seamless integration of the municipal street environment and civic destinations with that of the Parliamentary Precinct, Confederation Boulevard, and federal attractions such as the National Arts Centre and the Rideau Canal, by having regard for the quality and consistency in the quality of streetscape experiences and physical materials along the interfaces. Other capital cities will look to downtown Ottawa as an excellent demonstration of pedestrian and cycling priority districts.

Animated & Captivating

We will facilitate people of all ages and abilities to visit and linger along our downtown streets during weekdays and weekends, daytime and evenings, and in all seasons, by creating vibrant street life and opportunities for social and economic exchange. We will do so by enabling a diversity of at-grade oriented uses such as shops, cafes, and restaurants, by creating visual interest through public art, plantings, streetscape embellishments, and by facilitating cooperation with private and community bodies. Streets will become accessible for all. Our downtown will become a destination with a strong and identifiable sense of place and belonging.

Connective & Continuous

We will seek all opportunities to connect streets, pathways, building entrances, attractions, and open spaces within the downtown, as well as to and from adjacent communities such as the Parliamentary Precinct, LeBreton Flats, the Escarpment District, Chinatown, Little Italy, Centretown, Sandy Hill, Rideau Street, the ByWard Market, and Lowertown. We will do so by pursuing safe, convenient and continuous walking and cycling routes, through-block connections, bike lane extensions, multi-use pathway connections, way-finding systems and key connecting public urban squares and green spaces.

Active & Healthy

We will promote a healthy, active downtown lifestyle benefitting from walking and cycling on our downtown streets. We will do so by planning and designing streets that can provide infrastructure and amenities that support this activity, such as seats and benches, bike parking, shelters and comfort stations, drinking water, and healthy food choices, within the right-of-way or in buildings adjacent to it.

Safe & Accessible

We will ensure that our downtown streets and their connections to buildings and pathways will be safe, accessible and inclusive to pedestrians and cyclists of all ages and abilities, as well as motorists. We will do so by having regard for existing and emerging design codes and standards for safety and accessibility.

Competitive & Catalyzing

We will pursue a downtown where existing businesses and employers prosper and reinvest and where asset values are uplifted. We will do so by creating a street environment where consumers spend more time and money, and employees are satisfied with and proud of their place of work in downtown Ottawa. At the same time, we will provide an adequate (but perhaps incrementally diminishing) supply of on-street parking, loading and taxi areas.

Liveable & Safe

We will ensure that, through the quality, comfort, convenience and safety of our streets and supporting land uses and services, our downtown will be a highly coveted "community" to live in. We will do so by creating wonderful downtown streets and an excellent transit system, and by encouraging that supporting services be provided for people of all ages and abilities, including shopping, social services, recreation and health care.

Green, Sustainable & Enduring

We will create green and enduring downtown streets at a high standard that advances our capital as a sustainable city on the world stage. We will do so by planting trees shrubs and groundcovers wherever there is an opportunity to grow and be cared for, by exploring innovative drainage and paving techniques, by using recycled and energy efficient materials, and by other measures that reduce the street's life-cycle operating and maintenance requirements and reduce overall environmental footprint.

Streets in downtown Ottawa are not created equally, nor should they be. On first glance, from a distance, or to a visitor, there may appear to be a certain sameness to the city blocks forming the city core. The first impression is influenced by the abundance of relatively tall buildings that are the place of work for approximately 100,000 people, and the associated downtown activity involving pedestrians, cyclists, buses, and vehicles competing for space on busy streets. However, when peeling back the layers, it becomes apparent that there are many different character areas within the downtown. The analysis presented in Appendix B and D shows the variability and multiplicity of functions, characteristics, and conditions of downtown streets. This analysis builds on the City's *Downtown Ottawa Urban Design Strategy* which began to explore downtown Ottawa at the street level.

Furthermore, there are empty and underused spaces downtown that will be filled in with new buildings, changing the streetscape and adding further activity downtown. Once the Confederation Line project is running, development and street activity will further accelerate, and the function of some streets may change or be accentuated.

With this in mind, it is useful to conceive of the streets downtown in regards their individual natures within a larger "family" based on their planned function. Figure 2-2 provides the "Plan of Streets" which is a master plan and the major structuring element for the Downtown Moves framework. The Plan of Streets intends to meet this study's Vision and Strategic Directions. Moving forward, downtown streets will fall into one of six (6) categories, as follows (listed alphabetically):

Business Street

Business Streets provide access to the most intensive land uses in downtown Ottawa. Accordingly, they will provide for high volumes of all modes of movements, acting as connecting routes to, from and through the Central Area. They also act as pedestrian connections to the Downtown West, Downtown East and Rideau Confederation Line stations. Streets will carry out a multi-modal, utilitarian function, however they will also provide for improved urban design conditions. Buildings are to be oriented to the street as much as possible, recognizing the traditional office functions and large occupancies alongside these streets. East-west Business Streets include the east portions of Albert, Slater, Laurier, and Gloucester, as well as the MacKenzie Bridge and Daly Street. North-south Business Streets include the north portions of Lyon, Kent, O'Connor, Metcalfe and Nicholas. Slater Street has an additional opportunity created by the Confederation Line, where its bus-carrying function will be diminished on opening day and there will be an opportunity to reprogram its function for walking and cycling.

(image source: CC Antoine Belaieff)

Ceremonial Street

Ceremonial Streets provide access to uses and places of National importance and have the highest standard of streetscape design and amenity. They also act as connecting routes to, from and through the Central Area. Such streets include portions of Confederation Boulevard, which is the Capital's official ceremonial route as designated in the NCC's Plan for Canada's Capital. The streets are characterized by distinctive street lighting, wide sidewalks, and customized streetscape finishes. These streets enhance the links between downtown Ottawa and Confederation Boulevard, welding the civic and Capital realms together while recognizing the paramount importance and distinctiveness of the Confederation Boulevard. Adjacent buildings are typically large institutions set well back from the roadway. Ceremonial Streets in downtown Ottawa include Wellington, Elgin, MacKenzie, Sussex, and the north portion of Colonel By Drive and Queen Elizabeth Parkway. Wellington and Elgin have a special role in accommodating movement between the portions of downtown Ottawa on both sides of the Rideau Canal, over the Plaza Bridge.

Ottawa, ON

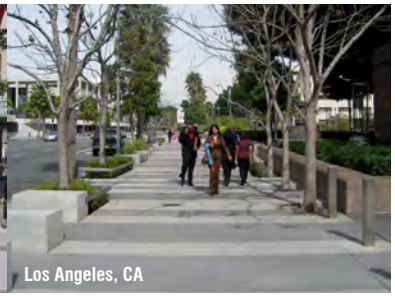
Ottawa, ON

Downtown Neighbourhood Street

Downtown Neighbourhood Streets provide access to primarily residential and institutional land uses in the western portion of downtown Ottawa and east of Waller Street and Nicholas Street. Here the streets play an important role in creating liveable neighbourhoods, and are expected to include green, living elements including grass and trees in the street right-of-way wherever possible. Buildings will have pedestrian and garage entrances that lead directly to the streets. Although Downtown Neighbourhood Streets are predominantly residential and cater to slower traffic speeds, they have a dual role of feeding into arterial streets and becoming part of the overall road network in downtown Ottawa. All portions of east-west streets west of Bay Street are to be Downtown Neighbourhood Streets. North-south Downtown Neighbourhood Streets include Bronson Avenue, Percy Street, Bay Street, and the southern portion of Lyon Street. Streets east of Waller/Nicholas are serving the University of Ottawa and Sandy Hill neighbourhoods and are also to be downtown neighbourhood streets.

Quebec City, QC

(image source: CC Antoine Belaieff)


Los Angeles, CA

(image source: © thegoodstreet.blogspot.ca

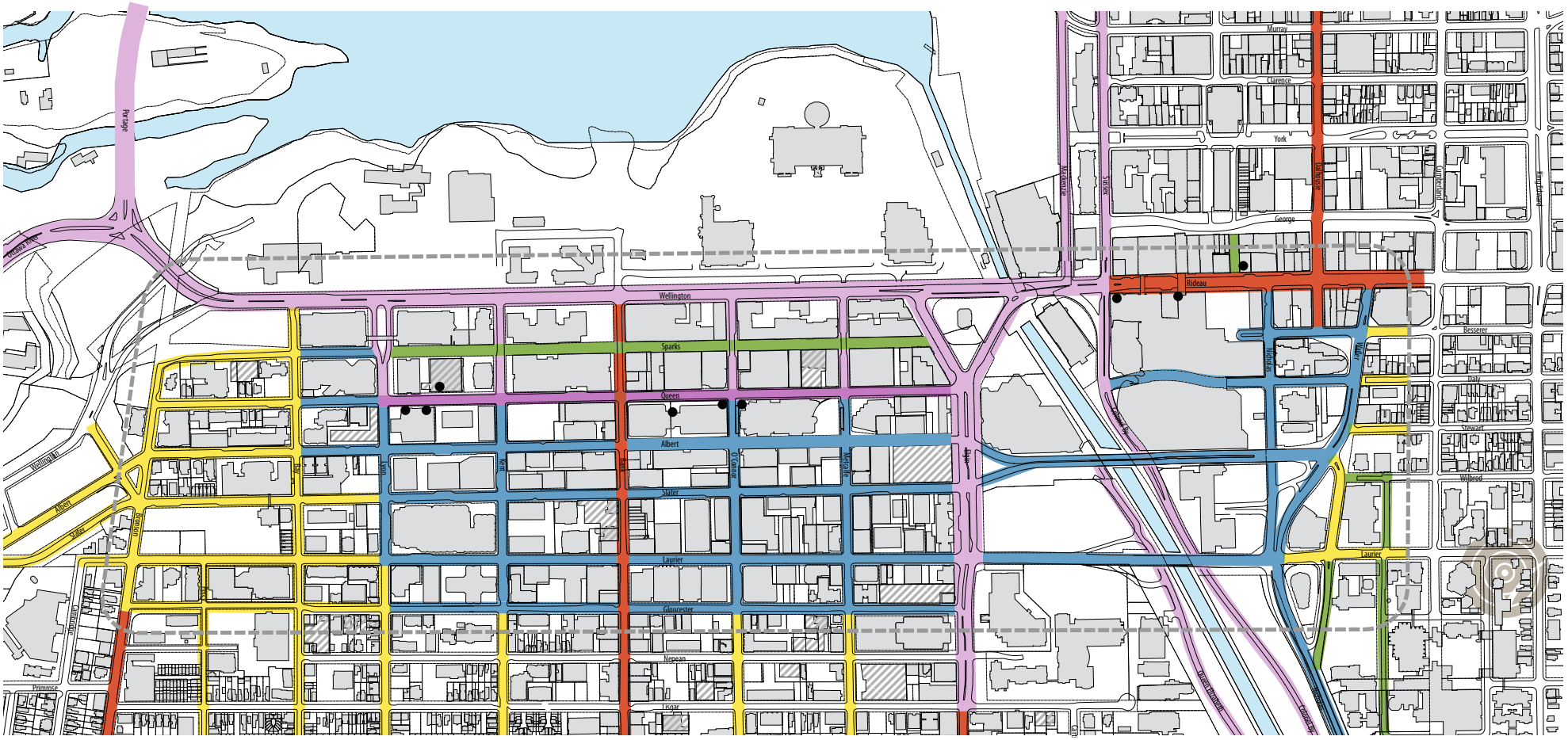
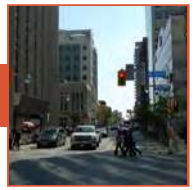


Figure 2-2: Plan of Streets

Main Street



Main Streets prosper in their historic role as providing access to shopping and services to downtown residents, workers, and visitors. These streets are generally characterized by wide sidewalks, some on-street parking, street trees, coordinated furnishings, enhanced street surface treatments, and integrated public art. Buildings are street-facing with an active at-grade orientation, and with narrow occupancies that provide for interesting storefronts. In downtown Ottawa, Bank Street and Rideau Street are Main Streets. Rideau Street will have the added pedestrian-related opportunities arising from the Confederation Line station located along it. Elgin Street, further to the south, is also a Main Street.

(image source: © IBI Group)

Plaza Street

Plaza Streets are primarily oriented to pedestrians, and take on the characteristics of pedestrian plazas. The streets have distinctive surfaces, such as paving stones, and are constructed with amenities to provide for pleasing walking environments. Service vehicles can access the street for deliveries and emergencies. Buildings are street-facing with an active at-grade orientation, and with narrow occupancies that provide for interesting storefronts. In downtown Ottawa, Sparks Street and William Street Mall are Plaza Streets.

(image source: © Downtown Calgary)

(image source: © Gehl Architects)

Showcase Street

Queen Street will be downtown Ottawa's Showcase Street. This designation recognizes the new vocation that will be assumed by Queen Street on the opening day of the Confederation Line. The street will have enormous demands to carry pedestrians to the Confederation Line station entrances along it. This new role brings a corresponding opportunity and requirement for the street to have generous wide sidewalks with the highest pedestrian level of service in Ottawa, and amenities to provide for safe, efficient, and comfortable walking. Over time, buildings will become more-street oriented with active uses at grade, benefitting from the new pedestrian economic opportunity. This planned function will be realized by showcasing the highest level of sustainable design, not only in wide sidewalks, but also in creative designs for parking and access, priority crosswalks, street tree planting, drainage, and materials.

San Francisco, CA

Toronto, ON

2.5 Vision Plans: Mobility Overlays

The Vision Plans are provided to guide the planning and design of streets and adjacent developments in downtown Ottawa, which will enable the streets to meet their planned function, as outlined in the Plan of Streets. In each Vision Plan, the priorities for each component are presented in a hierarchy, with the higher priority being listed first in the map legend. These Vision Plans will be particularly useful in refining the Plan of Streets and in focusing stakeholder dialogue and designer understanding of the planned function of downtown streets or portions of them when they become subject to street reconstruction or urban development projects.

The Street Design Toolkit to guide implementation of the Vision Plans is in section 3.

Vision for Pedestrian Mobility

The Vision for Pedestrian Mobility is to transform downtown Ottawa into an environment that prioritizes the movement and enjoyment of pedestrians. This transformation will include changes to the orientation and appearance of the buildings, characteristics of streets and the presence of open spaces, as these elements are critical to the pedestrian experience. Thus, the Vision for Pedestrian Mobility is conveyed by three connected Vision Plans that address these elements.

Pedestrian Vision Plan 1 (Pedestrian Infrastructure)

A classification of downtown streets is provided in this Vision Plan according to their potential to accommodate pedestrians after the opening of the Confederation Line. An integrated network of streets and mid-block connections promote ease of movement to and from Confederation Line stations, and throughout downtown Ottawa. Intersections expected to receive significant pedestrian volumes are enhanced by improvements that prioritize pedestrian crossing.

'Pedestrian 1' classifications indicate streets with the potential for accommodating the highest pedestrian volumes such as in the immediate vicinity of Confederation Line stations and/or pedestrian-only streets, and the subsequent 'Pedestrian 2 to Pedestrian 4' classifications indicate successively lower potential for accommodating pedestrian volume.

'Priority Pedestrian Crossings' are locations where the highest volumes of pedestrians are anticipated, and/or where there are opportunities to improve pedestrian safety and connectivity across downtown streets. All opportunities to improve the safety, comfort and level of service for pedestrians should be pursued at these priority locations.

'Current Mid-Block Connections Serving Confederation Line Stations' effectively shorten block lengths and enhance pedestrian mobility by providing off-street route choices. Potential future Mid-Block Connections Serving Confederation Line Stations indicate potential routes enabling pedestrians to reach Confederation Line station entrances with greater ease.

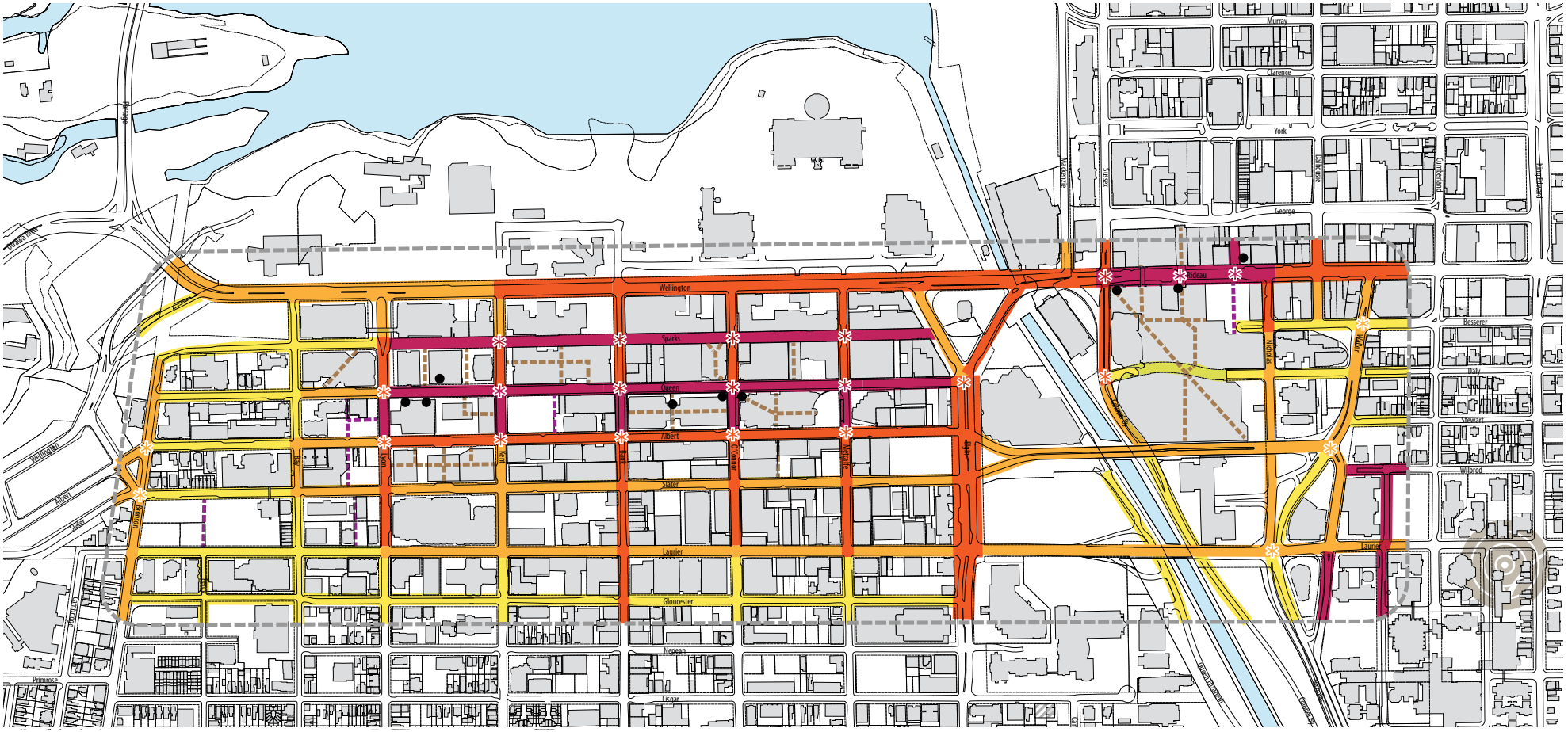


Figure 2-3: Pedestrian Vision Plan 1: Pedestrian Infrastructure

Pedestrian Vision Plan 2 (Urban Design)

This Vision Plan communicates the instrumental role played by streetscapes and buildings on the experience of pedestrians in downtown Ottawa. Although pedestrian-oriented streetscapes, building orientation and nodes are desired on all streets, this Vision Plan prioritizes specific streets and areas. High-quality, visually appealing streetscapes are necessary to attract pedestrian traffic and social activity, and building edges containing engaging uses at street level are vital to the commercial and civic appeal of downtown. The significance of heritage value on downtown streets is also represented.

'Priority Streetscapes' represent the strongest candidates for street beautification through the application of high-quality street furnishings and materials. These streetscapes are associated with vital downtown corridors that provide commercial and retail functions, as well as streets that will operate as pedestrian spines as a result of the Confederation Line.

'Priority Building Orientation' represents locations where pedestrian-oriented building facades are of the greatest functional importance. A high frequency of street-oriented building entrances and the application of inviting building materials at street level are recommended. Activity-generating uses, such as retail stores, restaurants, and civic uses, are important for the pedestrian experience in these areas.

'Priority Nodes' indicate the convergence of distinguishable precincts or neighbourhoods. Gateways or landmarks at these connecting points are recommended, through the design of buildings and/or streetscape elements, in order to create visual interest and assist with wayfinding.

'Heritage Conservation Districts' represent special character areas with a concentration of heritage resources that distinguish them from their surroundings, as designated by the City of Ottawa under the Ontario Heritage Act.

The character of 'Heritage Buildings' as protected under the City of Ottawa's zoning by-law and the Ontario Heritage Act. Heritage values strongly influence the character of streets, and must be considered in the design of streets.

'Important Capital View & Dynamic View Zone' represent significant views to the Parliament Hill precinct from the north-south streets within the study area as identified by the NCC in *Canada's Capital Views Protection (2007)*. Each view has an associated Dynamic View Zone in which views are protected by foreground design control. They include Metcalfe, O'Connor, Bank, Kent, Lyon and Bay Streets. The most significant is Metcalfe Street with an important view of the Central Block of the Parliament Buildings with a relatively long Dynamic View Zone.

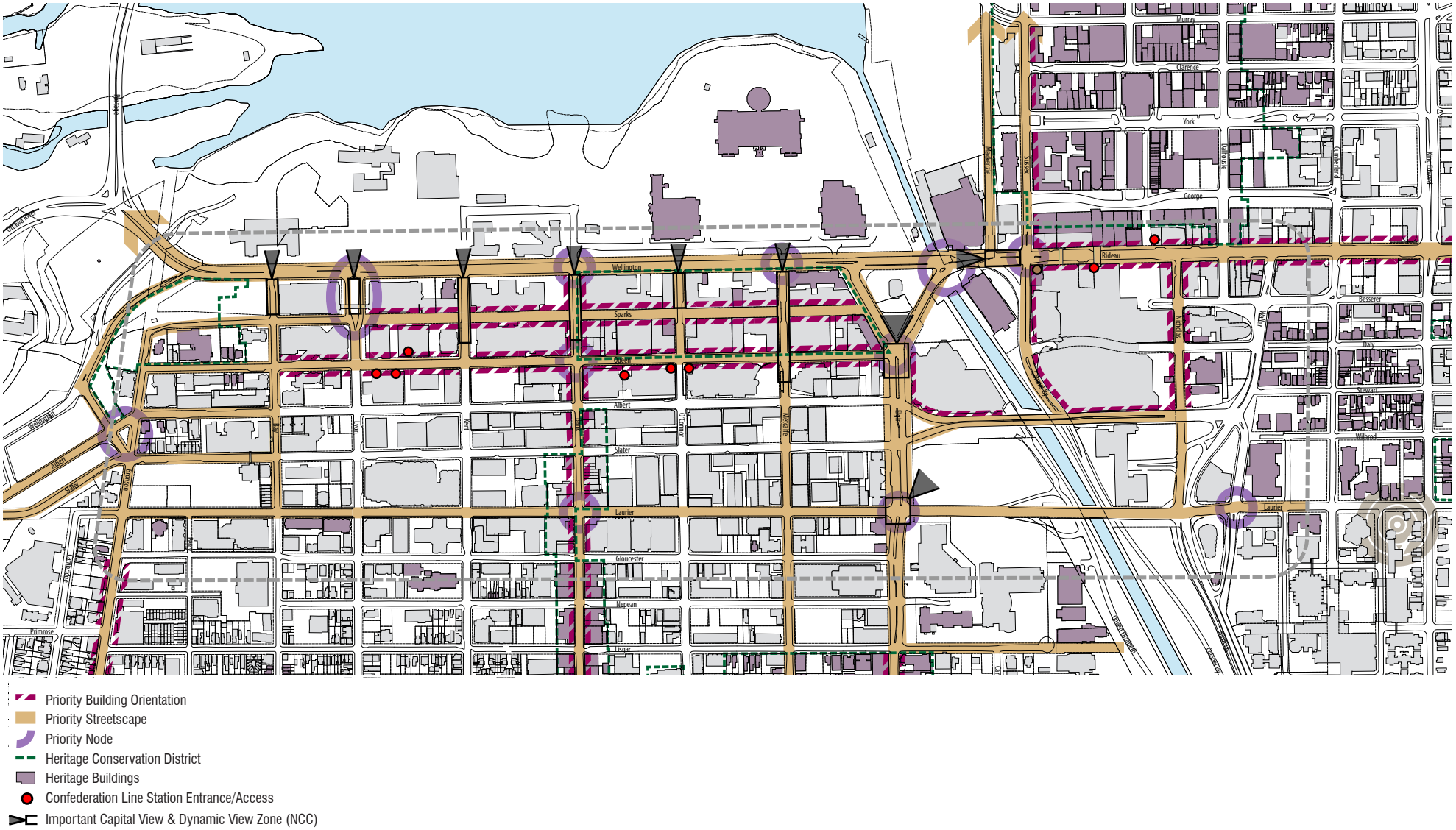


Figure 2-4: Pedestrian Vision Plan 2: Urban Design

Pedestrian Vision Plan 3 (Public & Open Space)

This Vision Plan demonstrates a network of public and semi-public open spaces, which will enhance pedestrian comfort and provide green and leisure spaces throughout downtown Ottawa. Tree-lined streets and pocket parks, in particular, provide respite from the fast-paced urban environment.

'New Open Spaces Associated with Development Sites' indicate opportunities for new publicly accessible open spaces to be created in conjunction with new developments. Open space requirements, as part of new development, will ensure the provision of additional open space as downtown Ottawa intensifies.

'Key Green Links' represent priority corridors along which consistent landscaping and street tree planting should be encouraged to improve the comfort of downtown streets and connect green spaces.

'Public Open Spaces' indicate parks, plazas, pedestrian malls, and green spaces that are found in downtown Ottawa.

'Existing Semi-public Open Spaces' are urban respite spaces where public access is granted, but are typically associated with a private development.

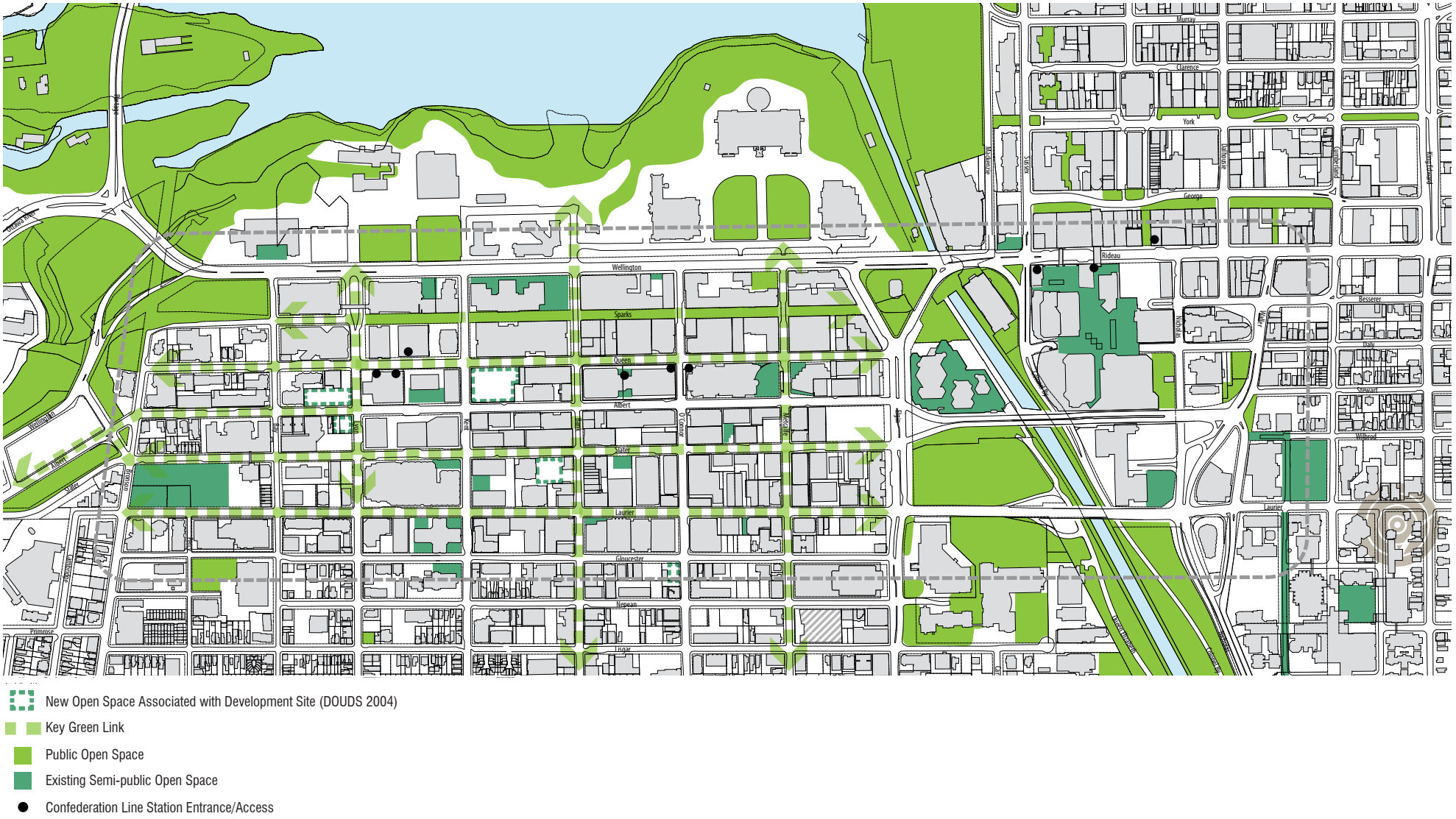

New Open Space Associated with Development Site (DOUDS 2004)
Key Green Link
Public Open Space
Existing Semi-public Open Space
Confederation Line Station Entrance/Access

Figure 2-5: Pedestrian Vision Plan 3: Public & Open Space

Vision for Cycling Mobility

The Vision for Cycling Mobility is a comprehensive network of bicycle routes in downtown Ottawa, comprising both existing and future facilities. These facilities increase the bicycle-friendliness of downtown streets, and bolster the appeal of cycling as a mode of utilitarian transportation by strengthening links to surrounding neighbourhoods and areas.

Cycling Vision Plan

The envisioned bicycle network is illustrated in this Vision Plan, and the routes are organized into categories according to the degree of separation provided from other road users. The type of facility identified for each route is based on considerations of network connectivity, and street character and function.

'Off-street Facilities', such as multi-use pathways, offer complete separation of cyclists from vehicle traffic. These facilities are typically bidirectional, and space is shared between cyclists and pedestrians.

'Shared Spaces' provide street right-of-ways that are primarily shared by pedestrians and cyclists, although service vehicles are also permitted.

'Separated Facilities' include a diverse set of solutions that apportion space for cyclists in the right-of-way. They range from "segregated facilities", which feature physical barriers or elevated lanes to separated cyclists from vehicle traffic, to "dedicated bike lanes", where a cyclist-only lane is painted on the road surface.

'Shared Lanes' require motorists and cyclists to travel in the same lane. Although these lanes do not provide any physical separation, they are wider than regular vehicle lanes. This type of facility is wider than regular vehicle lanes and may be designated with sharrows (paint markings).

A more detailed discussion of the different types can be found in Section 3.3.

Off-street Facilities

(image source: CC David Carroll)

Shared Spaces

Separated Facilities

(image source: CC Richard Akerman)

Shared Lanes

(image source: CC Eric Gilliland)

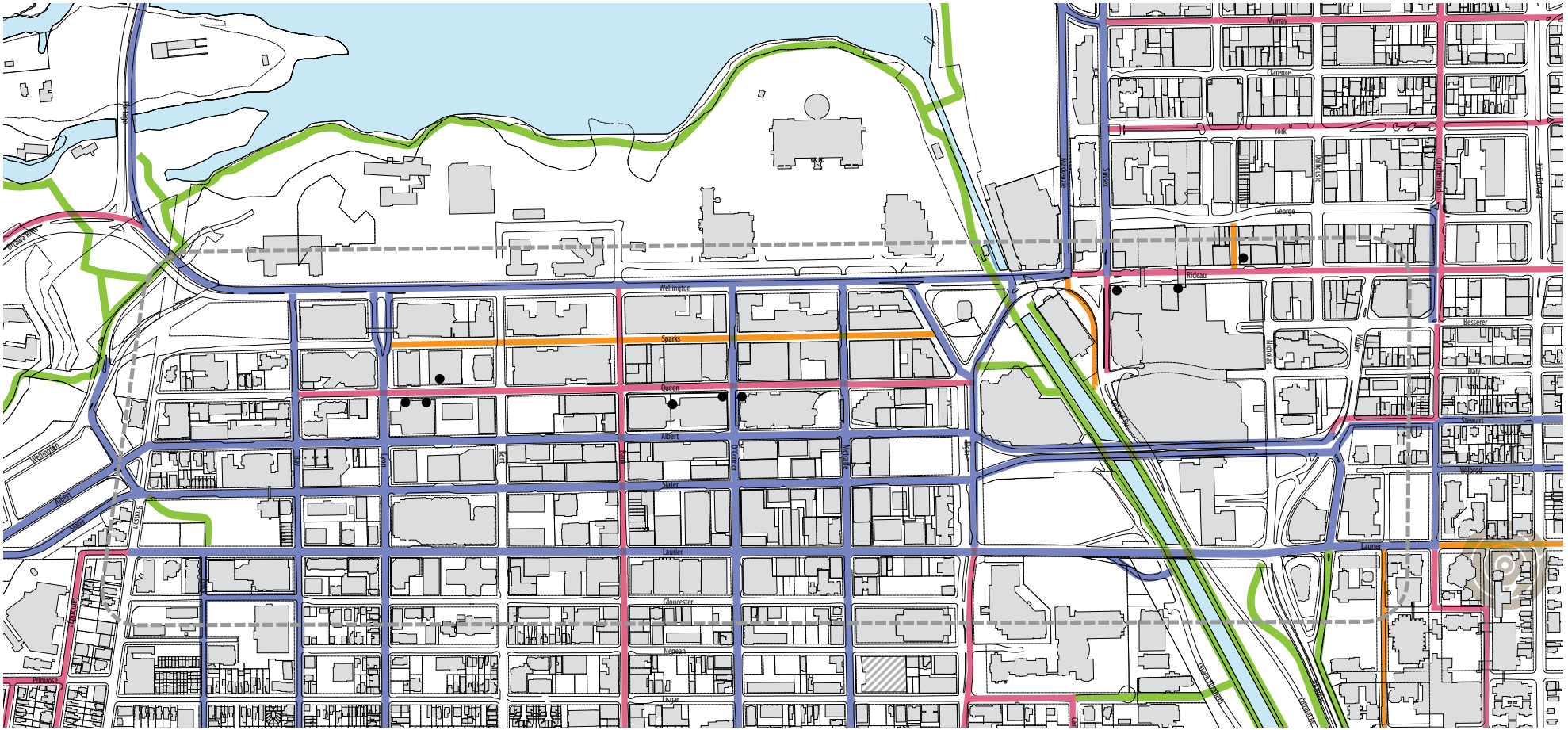


Figure 2-6: Cycling Vision Plan - Study Area

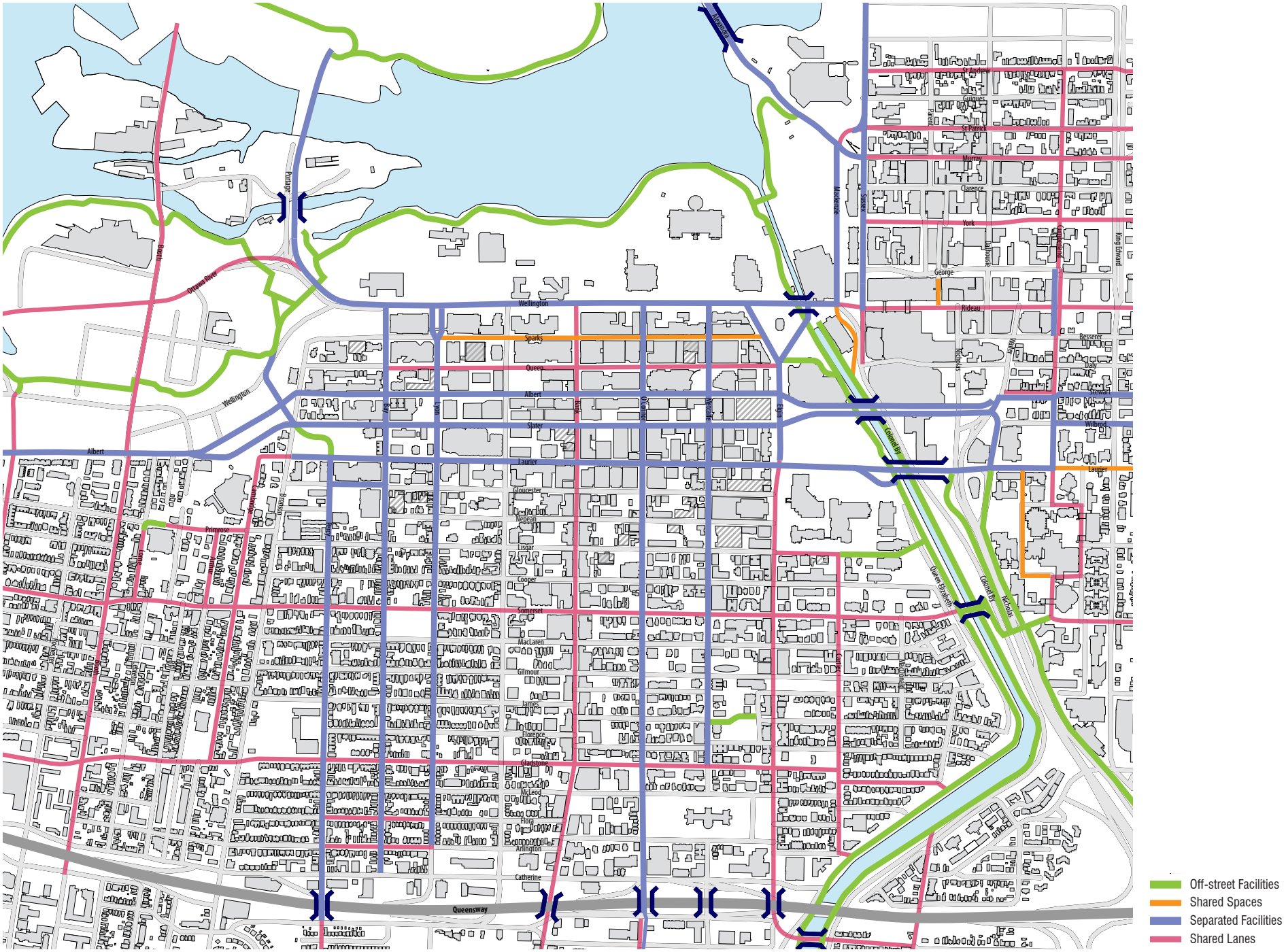


Figure 2-7: Cycling Vision Plan - Immediate Context

Vision for Transit Mobility

The Vision for Transit Mobility in downtown Ottawa is a high-quality transit network with integrated bus and Confederation Line service that meets the needs of both local residents and commuters. Both transit systems will adequately meet the needs of people of all ages and abilities, including our yourth, seniors and individuals with disabilities.

All bus routes running through downtown Ottawa will connect to at least one Confederation Line station, where riders can interchange between the bus and Confederation Line systems with ease due to the operational principle that bus alightings/boarding will take place along the block perimeter and on the same side of the street as a Confederation Line station entrance/access.

Transit Vision Plan

'Bus Transit Streets' are those that will support bus operation after the opening of the Confederation Line system, and are therefore capable of accommodating the physical requirements of considerable bus movement. The 'Optional Bus Transit Streets' represent potential candidate streets for supporting bus transit movement.

'Bus-Confederation Line Interface Blocks' will support passenger transfers between the bus and Confederation Line, and are therefore they are suitable for high quality transit-related services, such as widened sidewalks and bus platforms, real-time bus information, and functional street furniture.

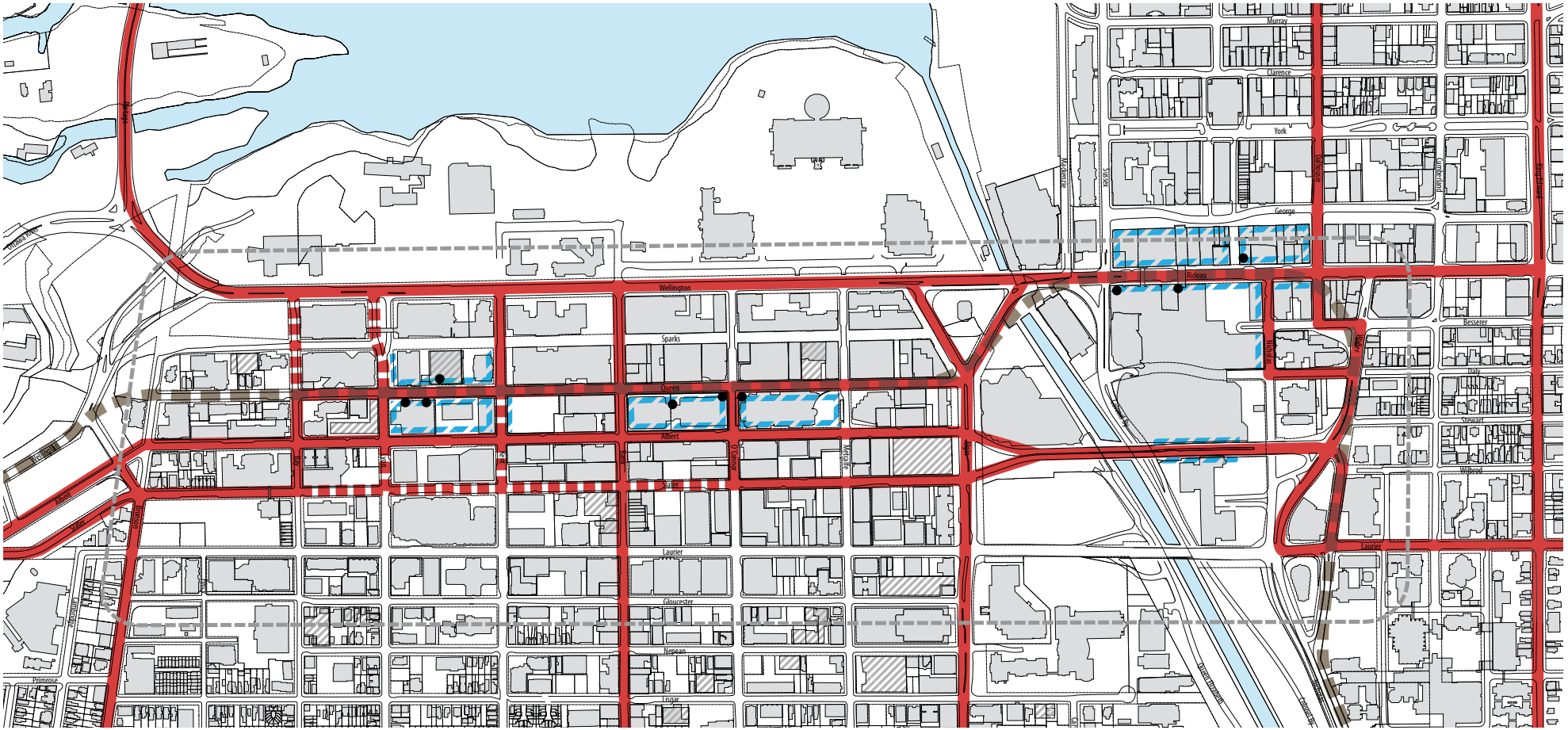


Figure 2-8: Transit Vision Plan

Vision for Vehicle Mobility

The Vision for Vehicle Mobility is a network of streets that allow the continued operation of businesses and other employment activities in downtown Ottawa, with adequate provisions for vehicle flow while, at the same time, incrementally reducing the dominance of vehicles downtown. Key vehicle transportation routes are essential to connecting downtown with the surrounding city, and to the Province of Quebec.

Vehicle Access Vision Plan

This Vision Plan outlines features relating to vehicle access, parking and movements which are vital to the day-to-day function and economic vitality of downtown Ottawa, and are therefore important considerations for street design.

'Major Building Laybys' represent designated spaces along the side of streets for the loading and delivery of goods, which are integral for businesses operating within the constrained spaces of downtown streets. These areas can also accommodate the needs of tour buses, taxis, and other vehicles requiring access.

'Structured Parking' is shown to highlight parking facilities whose continued operation must be considered for downtown streets. The numbers shown represent estimates of the total parking spaces within each parking facility.

'Major Driveways' on Wellington Street indicate important points of access for vehicles, despite not being part of the City-operated public road network.

'Queensway Connecting Streets' represent the main thoroughfares that channel vehicles between the Queensway and downtown Ottawa, a function that will continue into the foreseeable future.

'Perimeter Connectors' represent important roadways that connect downtown Ottawa with surrounding neighbourhoods and areas to the west, north and east, including out-of-province locations. They, therefore, play an essential role for vehicles moving in and out of the downtown.

'Thresholds' indicate points at which areas with differing functional road characteristics meet, resulting in a change of road character, modifying driver behaviour and shifting the relationship between all road users.

'Potential Tour Bus Loading Areas' represent areas anticipated to attract a high volume of tour buses due to their close proximity to tourist attractions. Therefore, tour bus drop-off and pickup areas may be required.

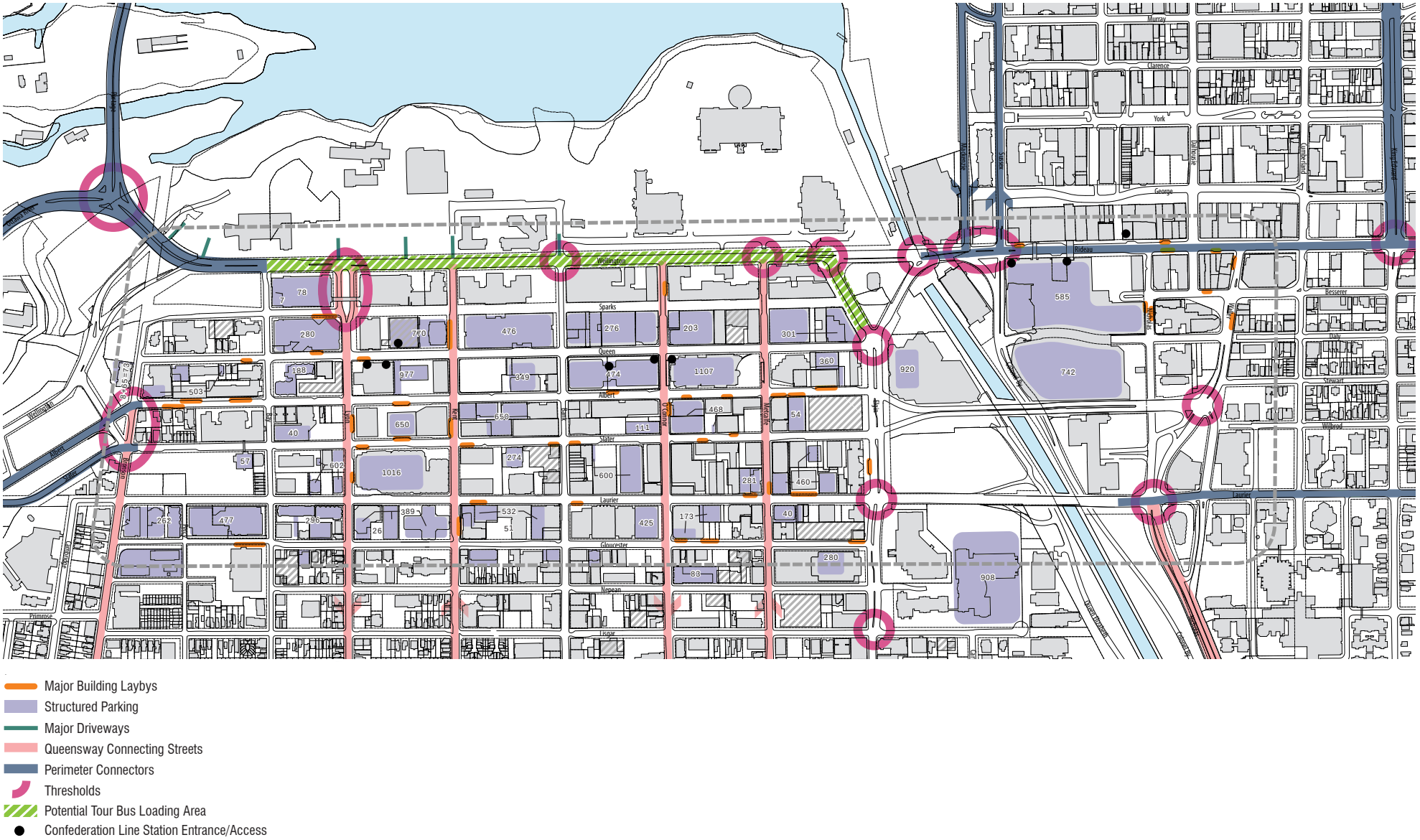


Figure 2-9: Vehicle Access Vision Plan

3.1 Mobility Criteria
3.2 Pedestrian (P)
3.3 Cyclists (C)
3.4 Transit (T)
3.5 Vehicles (V)
3.6 Complete Street Design Solutions

3 Street Design Toolkit

This street design toolkit provides Mobility Criteria and Guidelines which have regard for the Vision and Strategic Directions outlined in Section 2. It also provides complete street design solutions to guide the planning, design and decision making for streets in downtown Ottawa.

3.1 Mobility Criteria

The Mobility Criteria provided in this Street Design Toolkit were developed with regard to the Vision and Strategic Directions outlined in Section 2. They are organized into the following categories:

3.2 Pedestrian **(P)**

3.3 Cyclists **(C)**

3.4 Transit **(T)**

3.5 Vehicles **(V)**

This section provides a set of criteria that can be used to guide the design and evaluation of street design tools and solutions for downtown Ottawa. The criteria address the Vision and Strategic Directions for downtown Ottawa. They will also be useful criteria to aid in the completion of environmental assessments of individual projects that may emerge from the Downtown Moves initiative.

Criteria for Pedestrian Mobility

Improving the quality of the pedestrian experience is important to establishing a character and identity for downtown Ottawa, and a step toward developing downtown as a more vibrant and diverse destination and neighbourhood.

Downtown Ottawa will provide:

- **P1** High Pedestrian Level-of-Service

- **P2** Comfortable Sidewalks & Crosswalks

- **P3** Sustainable Planting

- **P4** A Family of Light Standards, Furnishings & Amenities

- **P5** Clear Signage & Wayfinding

- **P6** Pedestrian Connections Between & Through Buildings

- **P7** Buildings that Create a Visually Stimulating Public Realm

- **P8** A Network of Publicly Available Open Spaces

- **P9** Public Art to Add Interest to Pedestrian Environments

- **P10** Clearly Identifiable Gateways & Nodes

- **P11** Integrated Accessibility for All

- **P12** Pedestrian Easements for Enhanced Pedestrian Mobility

Criteria for Cycling Mobility

Creating a safe, connected bicycle network is an important part of a balanced transportation network and integral to encouraging higher bicycle ridership.

Downtown Ottawa will provide:

C1 An Integrated Network of Cycling Routes

C2 Safe, Prioritized Intersections

C3 Plentiful & Easy to Find Bicycle Parking & Amenities

C4 Bicycle Sharing Stations at Key Locations

Criteria for Transit Mobility

A fast and comprehensive transit network is a very important element to enable the efficient and continuous movement of large flows of people across downtown Ottawa.

Downtown Ottawa will provide:

T1 Efficient & Reliable Bus Transit

T2 Optimized Connectivity Between All Modes & Confederation Line Stations

T3 Improved Integration Between Bus Stops & Bicycle Lanes

T4 Enhanced Bus Stop Zones & Amenities

Criteria for Vehicle Mobility

A vibrant and economically successful downtown is supported by a cohesive and efficient road network that enables vehicle flow, provides well-located loading areas, has strategic on-street parking and offers access to off-street parking arrangements.

Downtown Ottawa will provide:

V1 Reduced Traffic Speeds for Safety & Comfort of Other Modes

V2 Suitable Access for Parking, Loading, Tour Buses & Taxi Stands

V3 Adequate Capacity & Level of Service

V4 Balanced Network of One-way & Two-way Streets

V5 Safe Interaction between Vehicle Access Points & Sidewalks

Improving the quality of the pedestrian experience is important to establish a character and identity for downtown Ottawa, and a step toward developing downtown as a more vibrant and diverse destination and neighbourhood.

The City is committed, through policies in the Official Plan and Transportation Master Plan, to changing public travel choices and reducing dependence on the automobile.

In order to support and encourage a pedestrian culture, it is important to consider a variety of elements that will enhance the pedestrian experience. They include, among others, the quality and connectivity of pedestrian spaces, accessibility of sidewalks to pedestrians of all ages and abilities, safety of the streets, animation of the public realm and permeability between sidewalks and the ground level of buildings.

P1 High Pedestrian Level-of-Service

A sidewalk's capacity to accommodate peak pedestrian volume is measured by transportation engineers in regards to its 'Level of Service' (LOS). The LOS rating is dependent on the available area per pedestrian, which is measured based on the volume of pedestrians per hour and the effective walkway width (or pedestrian clearway). Once the data is obtained, the LOS is rated on a scale of A-F, where A is the best scenario and F implies that the sidewalk is over capacity (failure). This framework does not consider other conditions, such as the presence of street trees or ground floor retail, that contribute to a sidewalk's appeal and resulting LOS.

Pedestrian LOS rating definitions given by HCM 2010

LOS A Ability to move in a desired path, no need to alter movements (Average Space: >49.2 m^2)
LOS B Occasional need to adjust path to avoid conflicts (Average Space : >8.36-49.2 m^2)
LOS C Frequent need to adjust path to avoid conflict (Average Space : >3.71-8.36 m^2)
LOS D Speed and ability to pass slower pedestrians restricted (Average Space : >2.14-3.71 m^2)
LOS E Speed restricted, very limited ability to pass slower pedestrians (Average Space : >1.02-2.14
LOS F Speeds severely restricted, frequent contact with other users (Average Space : ≤1.02 m^2)

Effective Sidewalk Width	Approximate # of Pedestrians per hour (Platoon Flow)							
	250	500	1000	2000	3000	4000	5000	6000
1.2m	LOS B	LOS B	LOS C	LOS D	LOS E	LOS E	LOS F	LOS F
1.5m	LOS B	LOS B	LOS C	LOS D	LOS D	LOS E	LOS E	LOS F
2.0m	LOS B	LOS B	LOS B	LOS C	LOS D	LOS D	LOS E	LOS E
2.5m	LOS B	LOS B	LOS B	LOS C	LOS C	LOS D	LOS D	LOS E
3.0m	LOS A	LOS B	LOS B	LOS C	LOS C	LOS D	LOS D	LOS D
3.5m	LOS A	LOS B	LOS B	LOS B	LOS C	LOS C	LOS D	LOS D
4.0m	LOS A	LOS B	LOS B	LOS B	LOS C	LOS C	LOS C	LOS D
4.5m	LOS A	LOS B	LOS B	LOS B	LOS B	LOS C	LOS C	LOS D
5.0m	LOS A	LOS B	LOS B	LOS B	LOS B	LOS C	LOS C	LOS C
5.5m	LOS A	LOS A	LOS B	LOS B	LOS B	LOS C	LOS C	LOS C
6.0m	LOS A	LOS A	LOS B	LOS B	LOS B	LOS C	LOS C	LOS C
6.5m	LOS A	LOS A	LOS B	LOS B	LOS B	LOS C	LOS C	LOS C
7.0m	LOS A	LOS A	LOS B	LOS B	LOS B	LOS B	LOS C	LOS C
7.5m	LOS A	LOS A	LOS B	LOS B	LOS B	LOS B	LOS C	LOS C
8.0m	LOS A	LOS A	LOS B	LOS B	LOS B	LOS B	LOS C	LOS C

Figure 3-1: Level of Service Definitions and Rate based on Sidewalk Width and Number of Pedestrians per Hour. Source: Data from Highway Capacity Manual, 2010, calibrated by Delcan, 2012.

P1.1 Establish pedestrian walkway widths based on pedestrian volumes and Level of Service (LOS). For the purpose of determining LOS, the peak hourly flow of pedestrians is based on the busiest 15 minutes of the day.

P1.2 "Platoon flow" is described as occurring when pedestrian-flow concentrates over short periods of time. Examples include pedestrians arriving via public transit and pedestrians controlled by traffic signals in short segments. Based on this context, the chart in Figure 3-1 helps determine the volume of pedestrians that a sidewalk can accommodate, the LOS rating of a sidewalk and the required width of the pedestrian clearway.

P1.3 In downtown Ottawa, peak hour pedestrian flows in the vicinity of the three Confederation Line stations are forecast to be approximately 6,500 at Downtown West Station, 9,400 at Downtown East Station, and 7,500 at Rideau Station (source: City of Ottawa, 2021 and 2031 AM Peak Hour Ridership Forecast Report OLRT Office). Using this LOS tool, it can be established that the clear or "effective" sidewalk width needs to be between 5.0m and 8.0m wide to achieve an LOS C rating. The "effective width" is net of the "utility zone" (when adjacent to street curbs, street lights, etc) and is also net of the "frontage zone" (when adjacent to buildings or obstacles). Within a limited right-of-way, this will have obvious implications on the space available for cyclists and vehicles. Figures 3-2 and 3-3 illustrate the elements that constitute the sidewalk width.

P1.4 More specific to where walkways meet at street corners and crosswalks, the LOS rating is determined by the following factors: volume of pedestrians, total area available per pedestrian, traffic volumes and traffic signal timing. Specific LOS for walkways at corners tends to be lower than that of the joining sidewalk. Although pedestrians are more tolerant to having less space at a corner due to standing idle, pedestrians will queue in the corner in large numbers before crossing the intersection. This means that if the LOS for a corner is desired to be equal to that of the sidewalk, the corner

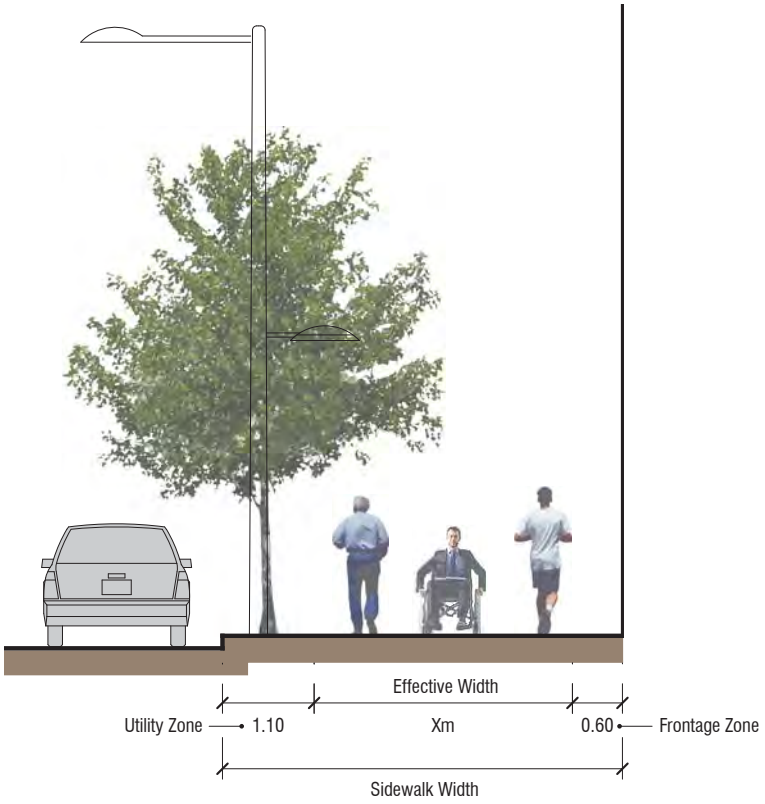


Figure 3-2: Elements that constitute sidewalk width

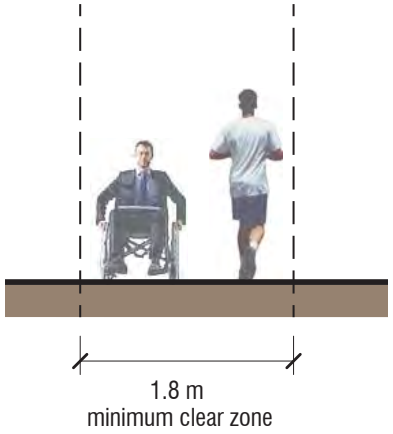


Figure 3-3: 1.8 m is the minimum clear pedestrian zone on a downtown sidewalk

area must be greater in size to accommodate the anticipated number of pedestrians. It is important to note that corners do not need a specific shape to accommodate a higher LOS, only a larger area. Scenarios to illustrate LOS for sidewalks, corners and crosswalks are available in Appendix E.

P1.5 The LOS categorization assumes that the pedestrian stream is composed of able-bodied, walking adults. The footprint and behaviour of a person using mobility assistance devices differs considerably from that of an able-bodied person. A small number of people in mobility assistance devices should not have a major impact on traffic flow. However, should numbers increase considerably as the population ages, the LOS categories may need to be revised to allot a greater amount of space per person.

Appendix E provides a visual analysis of pedestrian LOS ratios and their implications to sidewalks.

P2 Comfortable Sidewalks & Crosswalks

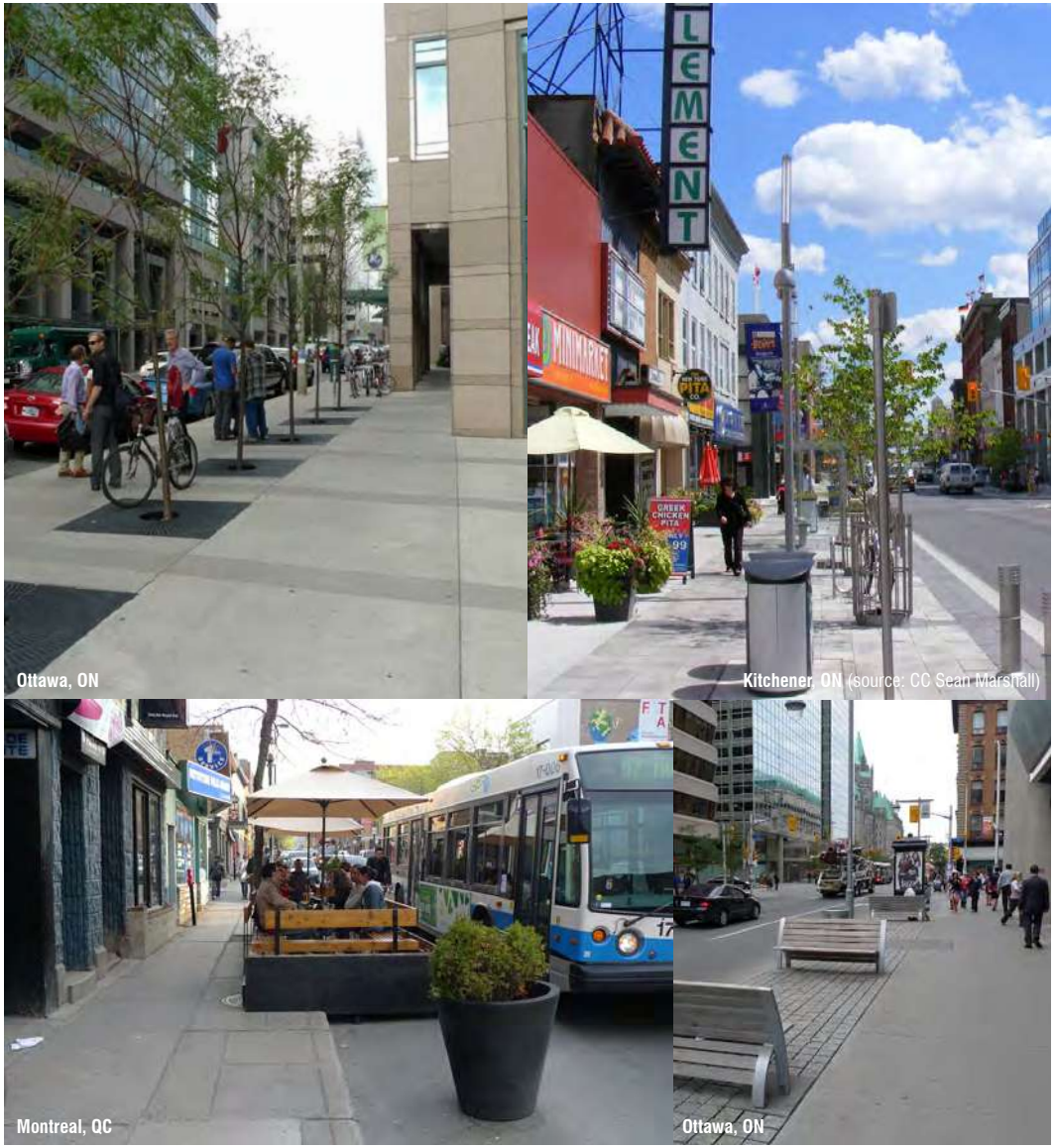
Creating safe, beautiful and comfortable pedestrian zones is an essential part of improving the streets of downtown Ottawa and accommodating the increased number of pedestrians moving to and from Confederation Line stations.

P2.1 Rebuild sidewalks to 3.0m wide, as a minimum;

- » Provide extra wide sidewalks for streets with or near Confederation Line stations, including Queen, Albert, O'Connor, Kent, Bank and Lyon Streets, with extra width near station entrance in accordance with pedestrian level-of-service requirements;
- » In some cases, sidewalks may not be the same width on each side of the street, for example Albert, Metcalfe, O'Connor, Kent and Bay Streets, due to differences in pedestrian level of service requirements.

P2.2 Notwithstanding the total width of the sidewalk and the arrangement of elements within the sidewalk, provide an absolute minimum 1.8m wide clear zone on all downtown sidewalks, to enable unencumbered passage of sidewalk users and maintenance vehicle access (see Figure 3-3).

P2.3 Consider the use of patterned or textured concrete, concrete pavers, or stone paving to enhance the quality of the pedestrian realm.



P2.4 Extend pedestrian zone paving materials continuously to the building frontage, do not change materials at the property line, particularly where there is a pedestrian easement. Further details are provided in P11.

P2.5 Ensure pedestrian areas are barrier free and accessible in accordance with the Ottawa Accessibility Design Standards.

P2.6 Establish maintenance standards for downtown Ottawa sidewalks and crosswalks that place them at the highest standard within the municipality, recognizing their strategic importance in providing mobility and access to downtown residences, businesses, and attractions.

P2.7 Provide crosswalk widths that are scaled to the clear width of sidewalks at the approaches, typically in the range of 3m to 5m, but never less than 3m.

P2.8 Use crosswalk bulb-outs to shorten crossing distance and expand pedestrian storage space at intersections.

P2.9 Emphasize pedestrian priority at crosswalks through the use of distinctive crosswalk surfaces such as architecturally scored concrete or oversized, durable paving stones.

P2.10 Use pedestrian scrambles at crosswalks having very high pedestrian movements, such as on Queen Street in proximity to proposed Confederation Line station entrances, and when there is a high propensity for diagonal crossings.

P2.11 Use raised "table top" intersections where the highest degree of pedestrian priority and emphasis is desired, such as in proximity to Confederation Line station entrances, major intersections with high pedestrian volumes, or on pedestrian promenades.

P2.12 Use mountable curbs to create a "flex space" - space in the street with pedestrian priority for cafes and markets, but where vehicles are permitted during certain times, for example, for parking, loading, deliveries, food trucks, or other vendors. Establish a paving and tactile warning band to demarcate transition from flex space to sidewalk. Consider flex space and mountable curbs for segments of Queen, Albert, Metcalfe, O'Connor and Kent Streets.

P2.13 Permit temporary sidewalk extensions into parking bays to provide a wider sidewalk during summer months. Consider sidewalk extensions for Queen, Albert, Laurier and Slater Streets.

Toronto, ON (source: CC Ryan Flores)

Kitchener, ON (source: © IBI Group)

P2.14 Set back buildings to create narrow pockets of public space and to create wider sidewalks in every opportunity.

P2.15 Identify short-term snow storage space on boulevards during the winter season as part of street designs.

P2.16 Provide pedestrian signals that emphasize pedestrian priority when crossing intersections:

- » Upgrade pedestrian signals at major intersection with signal timing and audible signals;
- » Correlate the signal timing with the crossing distance of the intersection, providing sufficient crossing time for all pedestrian abilities;
- » Reduce waiting time for pedestrians when using push buttons at intersections; and,
- » Set duration of the walk signal to allow pedestrians to cross the street at an average and slow pace of 0.7-0.9 metres/second (source: Transportation Impact Assessment Guidelines, City of Ottawa, October 2006 and 8-80 Cities.org).

Ottawa, ON

San Francisco, CA (source: CC Flickr user jeremyashaw

P3 Sustainable Planting

The *Downtown Ottawa Urban Design Strategy* (2004) recommends additional landscape treatment on downtown streets. That study states that at one time Ottawa's downtown streets supported a lush canopy of street trees. Today, narrow sidewalks, narrow rights-of-way, a lack of street trees and a lack of ground floor uses are some characteristics of downtown streets that contribute to unfavourable pedestrian environments. By re-balancing the space in the right-of-way, every opportunity to introduce sustainable planting in downtown Ottawa must be considered. This will contribute to provide a better transition between the lush tree-lined neighbourhoods of the Glebe and the cultural landscape of Parliament Hill.

P3.1 Develop an updated set of urban tree details and specifications for use in standard road construction documents and in site plan documents submitted as part of development proposals.

P3.2 Line the streets of downtown Ottawa with a diverse selection of resilient canopy tree species, contributing to the city's urban forest. Minimum 15 cubic metres soil per tree in a shared soil volume. Single trees require minimum 30 cubic metres soil volume. Structural soil cells or structural soils and structural sands can be used. Surfaces could be paved, with subsurface connected soil trenches.

Ottawa, ON

Ottawa, ON

Kitchener, ON (source: © IBI Group)

Ottawa, ON

Kitchener, ON (source: CC Sean Marshall)

P3.3 Where appropriate, use a diverse selection of urban tolerant shrub species to complement street tree plantings to create more dense plantings. These plants will become the understorey canopy beneath the urban forest. Minimum 3-5 cubic metres soil volume per shrub (depending on size). Soil volume can be shared, with a minimum 1.2 metres planting depth, and with connected soil volumes at grade.

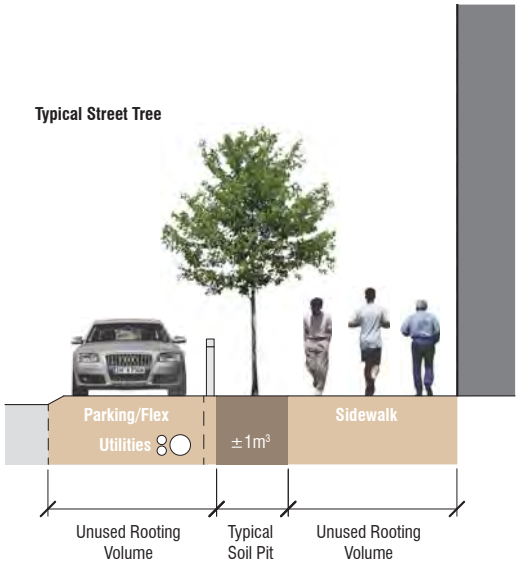
P3.4 In open pit planting beds, complement woody plants (ie. trees, shrubs) with a hardy groundcover for a comprehensive planting aesthetic, while providing a living/green barrier to pedestrian movement. Use a minimum 300mm planting depth with connected soil volumes at grade in exposed trenched soil matrices.

P3.5 Consider the planting of trees in regards to Hydro Ottawa's placement and guidelines for electricity distribution equipment. Both they type of tree and planting site must be reviewed to avoid interfering with overhead and underground utility lines.

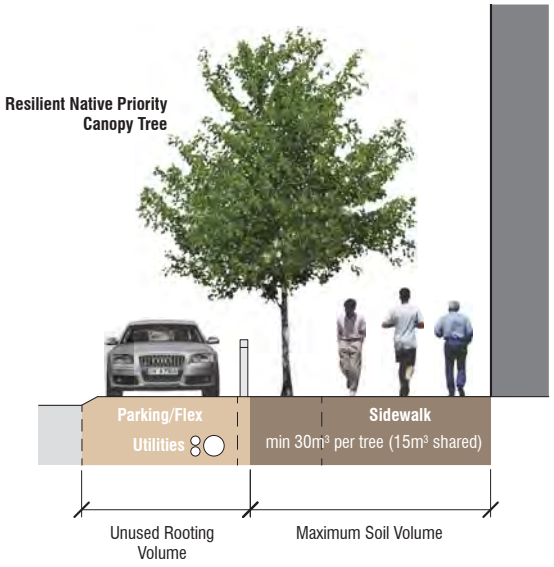
P3.6 Unique combinations of landscape species may be used on different streets to enhance the identity of downtown Ottawa.

P3.7 Plant trees as well as shrubs, perennials and grasses for complete, diverse and durable landscapes.

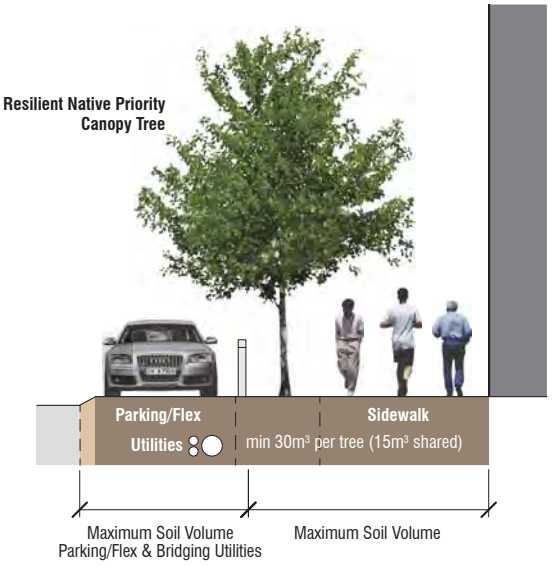
P3.8 Ground water recharge to improve soil and vegetation environment.



Existing Soil Volumes for Typical Planting Models



Proposed Soil Volumes for New Planting Models



Proposed Soil Volumes for New Planting Models

P4 A Family of Light Standards, Furnishings & Amenities

Some of Ottawa's downtown streets have good furniture and related amenities, such as those displayed along Elgin and Bank Streets. The City published guidelines for an Integrated Street Furniture Program (ISFP) in 2009 to improve the quality of the public realm through the creation of a cohesive system of street furniture. Downtown Ottawa can benefit from the creation of its own family (or sub-family) of streetscape elements that will address the more urban context and narrow rights-of-way and help to create a visually cohesive downtown.

P4.1 Create a coordinated family of street furnishings, to include benches, transit shelters, litter/recycling receptacles, light standards, bollards and signage and wayfinding, using the recommendations from the City's Integrated Street Furniture Policy and Design Guidelines (2009):

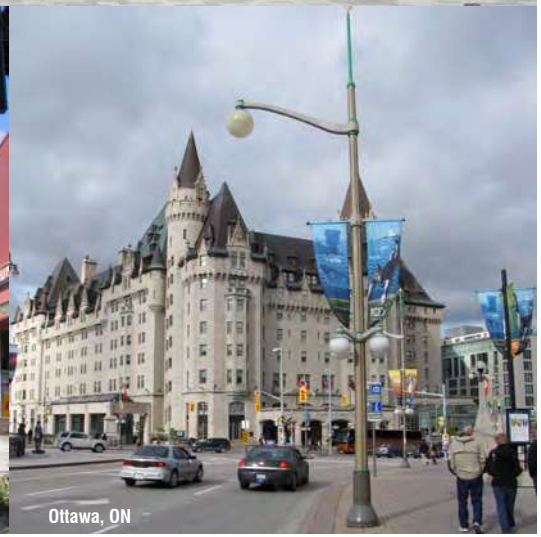
- » Install narrow bus shelters (minimum 1.5m shelter width);
- » Where possible, place shelters minimum 3.0m from curb edge;
- » If shelter cannot be accommodated, place schedule display case or bench; and,
- » Place furniture 0.6m from curb.

P4.2 Coordinate the suite of street furnishings with wayfinding and signage systems.

P4.3 Design the suite of street furnishings to have a high quality enduring and contemporary appeal, so that it can be consistently applied for years to come.

Ottawa, ON

Kitchener, ON (source: CC Sean Marshall)



Ottawa, ON

P4.4 Ensure that the design of the elements are compatible with those on Bank Street and Confederation Boulevard.

P4.5 Coordinate street lighting in accordance with the City of Ottawa's Right-of-Way Lighting Policy (2008), including:

- Sidewalks along arterial roads shall be lit to 10.0 lux with a uniformity of 4.0:1;
- Through-block pedestrian walkways shall be lit to 2.0 lux with a uniformity of 4.0:1; and,
- Bicycle lanes are to be illuminated based on the required roadway lighting levels.

P4.6 Manage clutter by placing street furniture, newspaper boxes and garbage receptacles in line between the curb and sidewalk to separate pedestrians from vehicles and cyclists travelling on the adjacent roadway.

P4.7 Encourage lighting on joint-use traffic signal poles, selecting luminaires from the City's Right-of-Way Lighting Policy (2008), Table 7.1.

P4.8 Minimize the installation of regulatory and non-regulatory signs on separate posts consolidating them wherever possible as apart of streetscape plan.

P5 Clear Signage & Wayfinding

Wayfinding and signage is an important part of creating a strong identity, while improving pedestrian orientation and sense of the city. Recent coordinated city-wide wayfinding projects have been successfully implemented in cities like Cleveland, Glasgow and London (UK).

P5.1 Design the signage and wayfinding system with a downtown Ottawa identity, complementing other street furnishings.

P5.2 Provide a directory of services/facilities on signage and wayfinding, including distances to main attractions.

P5.3 Coordinate the system in downtown Ottawa with a broad City-wide system.

P5.4 Design signage in accordance with the City's Tactile Signage Program. Characters and pictograms are raised 0.8 to 1.5mm above the surface, and have Grade 1 Braille located directly below pictograms or large text.

P5.5 Design the system to be easily interpreted by international visitors, relying on symbols.

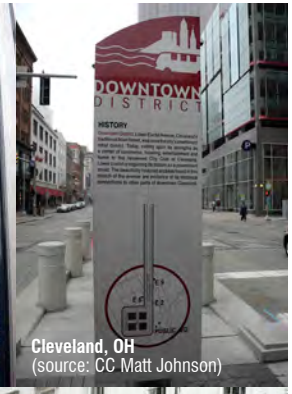
P5.6 Since space in the pedestrian realm in downtown Ottawa is so limited, carefully site signage and wayfinding.

P5.7 Integrate the system with Confederation Line signage and the existing NCC system.

P5.8 Coordinate with geo-referenced computer systems for navigation and information.

Seattle, WA (source: CC Oran Viriyincy)

Glasgow, UK (source: CC Kake Pugh)



Cleveland, OH (source: CC Matt Johnson)

London, UK (source: CC Martin Deutsch)

London, UK (source: CC Charlotte Gilhooly)

Philadelphia, PA (source: CC Eric Fredericks)

Lakeview, MI (source: CC Steven Vance)

London, UK

P6 Pedestrian Connections Between & Through Buildings

Mid-block outdoor and indoor pedestrian connections create a finer-grained, more permeable pedestrian network, improving the efficiency of walking trips.

Ottawa has many good indoor and outdoor pedestrian connections that are well-used, especially during winter months. Enhancing these connections will greatly improve the pedestrian environment.

P6.1 Make mid-block outdoor and indoor pedestrian connections well lit and signed to increase usage, safety and comfort. Use special surface materials and planting to identify outdoor routes.

P6.2 Explore the possibility of retail, restaurant, cafe, and other active uses along outdoor and indoor pedestrian connections.

P6.3 Seek opportunities to reduce barriers in and between existing pedestrian connections.

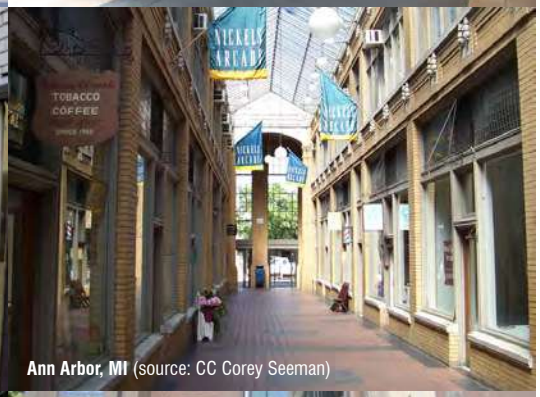
P6.4 Review and identify ways to improve personal security and accessibility among connections between and through buildings.

P6.5 Implement pedestrian connections between and through buildings via development review and/or incentive programs.

London, UK (source: CC Andrew Dunn)

London, UK (source: CC Andrew Dunn)

Yorkville, Toronto, ON



Ann Arbor, MI (source: CC Corey Seeman)

Boston, MA

Helsinki, Finland (source: CC Flickr user La Citta Vita)

P7 Buildings that Create a Visually Stimulating Public Realm

The *Downtown Ottawa Urban Design Strategy* recommends focusing on requirements for the articulation of facades at the lower levels of buildings with emphasis on the relationship of the building to the street at grade level. This can be encouraged during the site plan control approval process managed by the City of Ottawa.

P7.1 Encourage building owners to modify their ground floor uses and facades to create more permeable, transparent and active frontages, as part of major interior renovation investments.

P7.2 Ensure tall buildings maintain pedestrian scale through such means as having a podium with a step back to the tower, in accordance with the City of Ottawa's Urban Design Guidelines for High-Rise Housing.

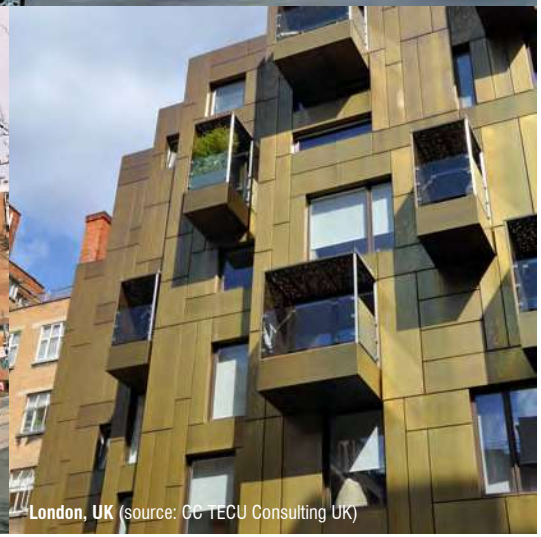
P7.3 Articulate building facades in a way that creates an interesting wall to the public room of the street. Articulation can make use of differences of transparency, quality of materials, fenestration, vertical elements and doors to break down the scale of the building.

P7.4 Ensure ground floor uses of a building are active and front onto the street. Active uses include lobbies, retail and offices. Utility rooms, garbage, loading areas and vehicle access should be at the back side of the building.

P7.5 Integrate space for outdoor cafes into the streetscape (allowing for the minimum sidewalk clear-

Yonge St, Richmond Hill, ON

King St E, Toronto, ON


London, UK (source: CC TECU Consulting UK)

ance). Outdoor cafes could be on temporary sidewalk extensions (in the parking lane) for the summer.

P7.6 Protect heritage buildings as identified in the City of Ottawa's Heritage List or under Parts IV and V of the Ontario Heritage Act.

P7.7 Ensure new buildings create a mix and variety of high quality architecture.

P7.8 Use corner sites (buildings with two frontages) as an urban design opportunity to frame the intersection, create landmark buildings, and create wider sidewalks.

P7.8 Make ground level floor heights a minimum of 4.5m for new commercial and residential buildings to allow flexibility for a diversity of future uses. This can be implemented through the Site Plan Control approval process.

P7.9 Retrofit the ground floor of existing buildings with active uses with a direct connection to the sidewalk. This is a particularly important consideration for pedestrian priority streets such as Queen, Metcalfe, Kent, O'Connor and Albert Streets.

P7.10 Where new infill development takes place, respect Hydro Ottawa's setback requirements from overhead distribution equipment to ensure safety (Hydro Ottawa Standard OLS0002).

Ottawa, ON

Yorkville, Toronto, ON

P8 A Network of Publicly Available Open Spaces

Parts of downtown Ottawa lack trees and green spaces, creating environments that are unfavourable to pedestrian activity. Although large public green spaces frame the edge of the downtown area - Parliament Hill, Major's Hill Park, Victoria Island and the banks of the Ottawa River and Rideau Canal - there is a deficiency of smaller urban open spaces in the downtown.

P8.1 As mentioned in the *Downtown Ottawa Urban Design Strategy*, and echoed in the Pedestrian Vision Plan for Public and Open Spaces, introduce a network of small open spaces before the area becomes fully built-out (refer to Section 2).

P8.2 Encourage developers to include urban open spaces in their development scenarios, employing such means as parkland dedication, amenity space provisions, and Section 37 of the Planning Act as applicable. This was successfully achieved at Minto Place, at the corner of Kent and Slater Streets, at Snider Plaza on Bank Street between Slater Street and Laurier Avenue, and at the World Exchange Plaza.

P8.3 Retrofit existing private and public open spaces that are underutilized.

P8.4 Introduce pocket parks and explore the possibility of temporary/seasonal open spaces to provide welcome relief and respite in downtown Ottawa. Quality open space will become increasingly important as downtown Ottawa intensifies.

New York, NY (source: CC Sampo Sikiö)

Port Credit, Mississauga, ON

Ottawa, ON

P8.5 Use a network of small open spaces in the right-of-way and mid-block locations to assist in connecting the civic element of downtown Ottawa with the capital landscape of the Confederation Boulevard and the Parliamentary Precinct.

P8.6 Closely coordinate with the National Capital Commission on the introduction of seating areas on semi-public space and animation of federally-owned open spaces.

P8.7 Include provisions in planning documents that enable new open spaces to be created downtown that can be integrated with streets and have a public or quasi-public function.

P8.8 Design and animate public and open spaces to be useable and appealing in all seasons with carefully located wind screens and shelters, appropriate landscape features, festivals, markets, surface treatment and amenities.

P8.9 Ensure open spaces use high quality and durable materials.

P8.10 Ensure open spaces are publicly accessible with furnishings that are coordinated with downtown Ottawa's family of streetscape furnishings.

P8.11 Design open spaces to be barrier free.

P8.12 Ensure designs provide clear views through the open space, to enhance safety.

P8.13 Include elements in open spaces to activate the street edge, eg. outdoor cafes, pop-up patios, fountains, and public art.

Oakville, ON

Madrid, ES

P9 Public Art to Add Interest to Pedestrian Environments

Public Art can play a significant role in establishing the identity of downtown Ottawa. As the capital of Canada, there is an exceptional opportunity for Ottawa to celebrate and showcase Canada's art and culture in the public realm. Currently, the City of Ottawa dedicates 1% of the construction costs of public infrastructure projects with budgets over $2 million towards the creation of public art. The NCC has created a series of public art tours (StreetSmART) in proximity to Confederation Boulevard that allows users to scan QR codes mounted in front of the artwork with their smartphone to view/hear information about the work. As per the *Ottawa 2012 Arts and Heritage Plan (2012-2018)*, recommended strategies and actions related to Ottawa's Central Area include:

P9.1 Integrate public art with streetscape elements such as seating, waste receptacles, paving, and railings.

P9.2 Design pedestrian arcades and other building elements as public art.

P9.3 Consider public art to add special identity to the public realm, with particular attention to using light to animate public space at night, especially in winter months.

P9.4 Support the development of cultural and creative districts and clusters at Confederation Line stations, including public art and native-themed installations.

P9.5 Provide increased incentives to property owners for the adaptive reuse of historically significant urban buildings and structures.

Ottawa, ON

Montreal, QC
(source: CC Flickr user art_inthecity)

Toronto, ON (source: CC Fred Lai)

Gatineau, QC (source: CC National Capital Commission)

Toronto, ON (source: CC Fred Lai)

P10 Clearly Identifiable Gateways & Nodes

Gateways are important in creating a sense of arrival when entering downtown Ottawa. Due to Ottawa's unique relationship between the Parliamentary precinct and downtown, gateways and nodes should be established to distinguish the "Crown to Town" interface as well as joining the boundaries between downtown and adjacent neighbourhoods such as LeBreton, Centretown and ByWard Market.

P10.1 Create gateways and nodes by a combination of landscape, streetscape, and built form elements specific to each threshold location.

P10.2 Establish pedestrian priority at gateway and node sites, for example, by adding amenities for pedestrians and repaving the surface with different materials, bulb-outs or colours, or by removing vehicular travel lanes or turn lanes.

P10.3 Use special and distinctive buildings at corners to help establish gateways and nodes.

Toronto, ON (source: CC Ivan Hernández)

Ottawa, ON

P11 Integrated Accessibility for All

Accommodating people of all abilities is integral to the design of pedestrian friendly streets. As per the *Ontarians with Disabilities Act* and (2001) and the *Accessibility for Ontarians with Disabilities Act* (2005), the City of Ottawa has the legislative responsibility to ensure public spaces are barrier-free and accessible to people of all ages, gender and abilities. To help ensure a consistent application of accessibility in the planning of the built environment, the City of Ottawa has developed its own *Accessibility Design Standards* (November 2012) to guide the development of accessible public facilities, roads, pathways and parks.

As all residents of Ottawa will experience variations in abilities throughout their lifespan, the following provisions will help build a pedestrian environment that is safe and usable for people of all ages, abilities and genders:

P11.1 Ensure that ground surfaces are firm, stable, well-drained, slip-resistant, with a colour contrast of at least 70% to distinguish the edges of exterior accessible routes and with a vertical change in level less than 6mm.

P11.2 Locate barrier-free rest areas adjacent to, and away from, accessible paths of travel. Ensure there is strong colour contrast to distinguish the spaces, and that there are accessible paths of travel leading to these locations.

P11.3 Minimize slope changes on accessible routes by permitting a maximum running slope gradient of 1:15 (6.67%), and providing 50 ± 10 mm wide colour-contrasted and slip-resistant strips equal to the width of the ramp. The ramp section should be no longer than 9000 mm.

P11.4 Provide tactile walking surface indicators at top of stairs, at a distance of one tread depth back from stairs, and with surface depth of 600 - 650 mm (minimum), extending the full length of the stairs.

P11.5 At pedestrian crossings at vehicular roadways, provide accessible pedestrian signals that are positioned for ease of operation by people using mobility devices, and that provide audible cues for crossing.

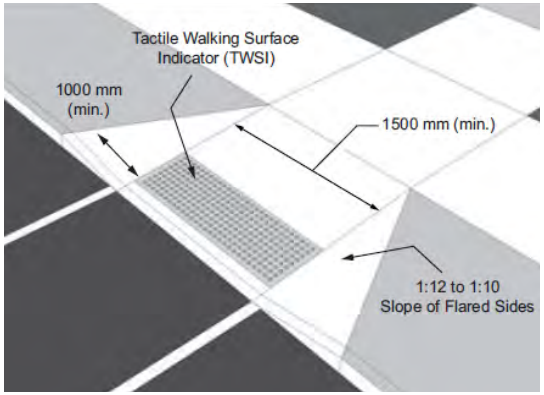
P11.6 Where gratings and covers are required, in both interior and exterior environments, ensure no opening is greater than 13 mm, in one direction and that the longer dimension of opening is perpendicular to the pedestrian path of travel.

P11.7 Place benches and seats at 450 to 500 mm above finished floor/ground, ensuring that seat depth is between 510 to 610 mm and back support at least 1065 mm long. Street furniture can greatly help people who may have difficulty with standing or walking for extended periods.

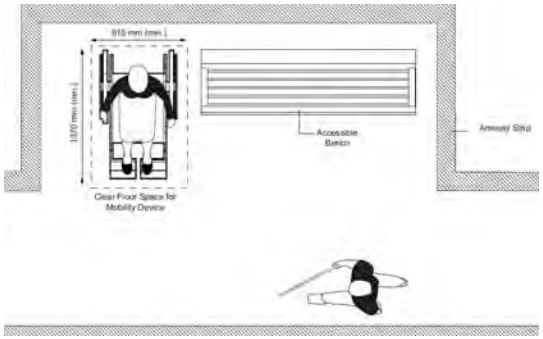
P11.8 Encourage pedestrian connections through buildings to provide signage and wayfinding cues along all interior accessible routes, including entrances and exits, to provide information and guidance for all users.

Toronto, ON

Atlanta, GA (source: GO PEDS.org)



Source: Accessibility Design Standards, City of Ottawa, November 2012


Source: Accessibility Design Standards, City of Ottawa, November 2012

P12 Pedestrian Easements for Enhanced Pedestrian Mobility

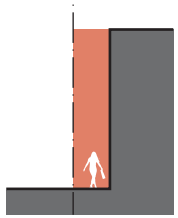
Pedestrian easements have been required by Ottawa's Official Plan in the Central Area for over 25 years.

The primary purpose of the pedestrian easement policy is to create additional space along the edges of narrow rights-of-way, specifically for the use of pedestrians. On applicable streets, the pedestrian easement is required along the full length of the property frontage. The policy is described in Annex 1 - Road Classification and Rights-of-Way in Section 7 of Volume 1 of the Official Plan.

Most streets where the policy for pedestrian easements applies are also subject to ROW widening requirements. In combining ROW widening with the pedestrian easement, even more significant increases to the space available for the pedestrian realm becomes possible.

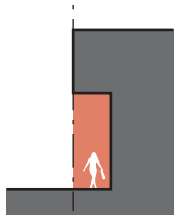
The pedestrian easements that have been created in downtown Ottawa can be divided into four different types: setback, cantilever/overhang, 2+ storey colonnade/arcade, and 1 storey colonnade/arcade. The setback (Type 1) appears to be the most common approach to addressing the pedestrian easement requirement.

The colonnades/arcades (Types 3 and 4) that have been built in Ottawa have not been particularly successful from a pedestrian, retail or design perspective, often feeling very dark, with poor visibility from the street and disconnection with the sidewalk. These deficiencies are particularly acute for single-storey colonnades/arcades (Type 4).



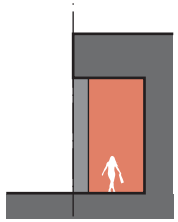
Type 1

Setback (Including Canopy)



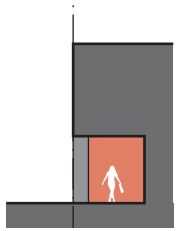
Type 2

Cantilever/Overhang



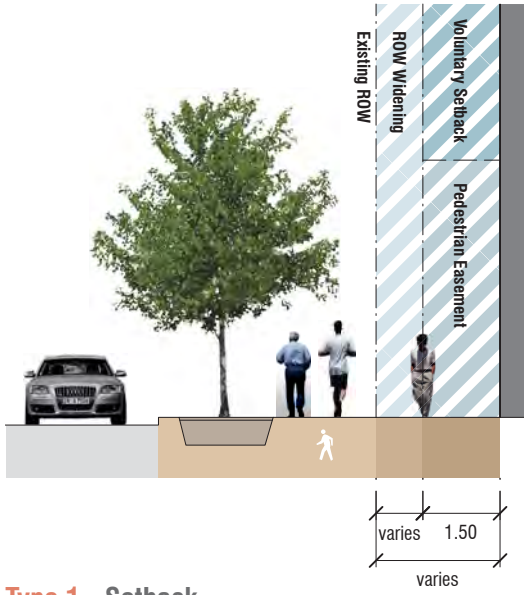
Type 3

2+ Storey Colonnade/Arcade

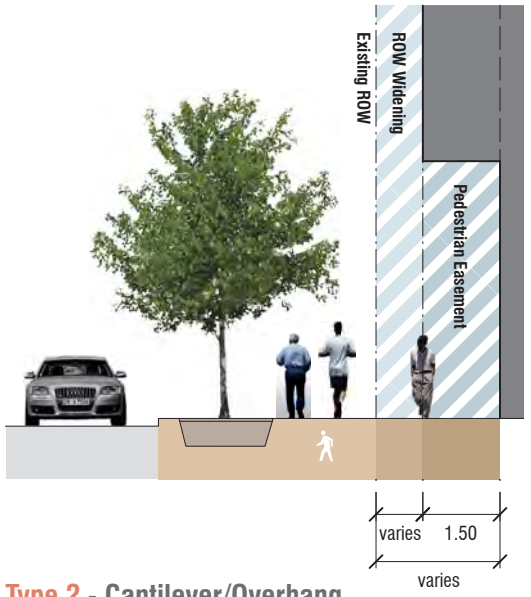


Type 4

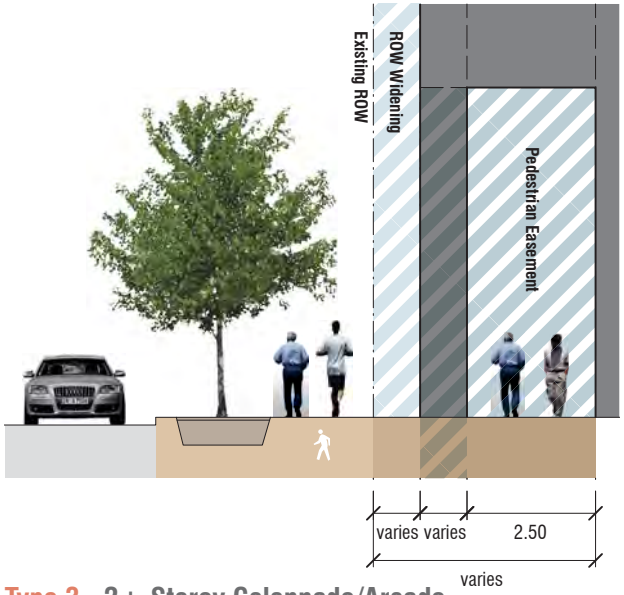
1 Storey Colonnade/Arcade



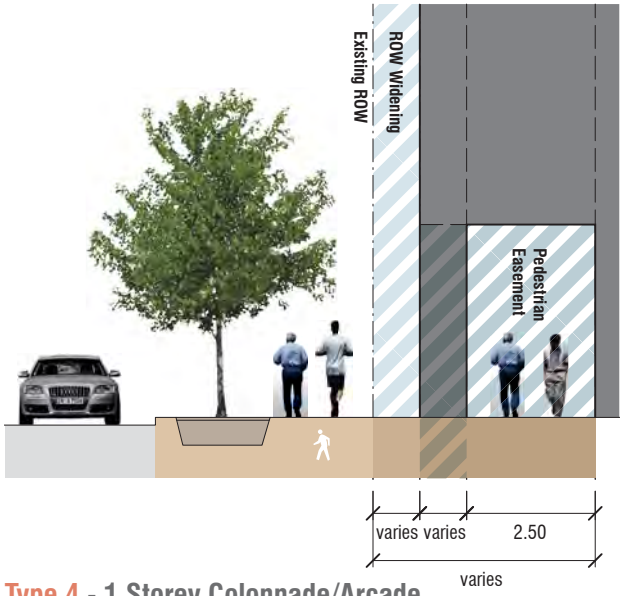
Type 1 - Setback



Type 2 - Cantilever/Overhang



Type 3 - 2+ Storey Colonnade/Arcade



Type 4 - 1 Storey Colonnade/Arcade

P12.1 Continue to require pedestrian easements to augment sidewalk capacity, increase space for pedestrians at street corners and building entrances.

P12.2 Establish a hierarchy among solutions that requires the use of setbacks and cantilevers as the typology for pedestrian easements rather than colonnades/arcades.

P12.3 Modify the Official Plan to apply the widening easement policy to Queen Street (Lyon to Elgin) and O'Connor Street (Wellington to Nepean).

P12.4 For the cantilever/overhang type, increase the minimum height of the pedestrian easement to 4.5 metres.

P12.5 For new colonnade/arcade types, increase the minimum height of the pedestrian easement to the equivalent of 2 storeys in height.

P12.6 Where setbacks and cantilevers cannot be implemented due to structural or other design issues, ensure that colonnades/arcades contribute to the augmentation of the public space of the street. The size, shape and frequency of columns and the height of the space created are important factors in determining the perception of continuity, accessibility, visibility personal security and usefulness of the colonnade/arcade space.

P12.7 Ensure pedestrian easements form an accessible extension of the sidewalk, and are a clearway allowing through movement with no permanent obstructions except for locations where a patio or market zone has been permitted due to adequate sidewalk width.

P12.8 Ensure pedestrian easements surfaces are at the same level as the adjacent sidewalk, with no steps, curbs, ramps, or other obstructions that would not be permitted on a sidewalk.

P12.9 Ensure that transitions in grade, including steps, ramps, retaining walls, and the provision of site furnishings, including seating, bike racks, displays, planters, etc. are beyond the clear pedestrian zone required in the easement policy.

P12.10 Design pedestrian easement surfaces to be contiguous and materially complementary with the adjacent sidewalk since pedestrians are meant to see and use the entire pedestrian realm without distinction. If definition is desired to indicate the boundary between public right-of-way and private property, consider a paving band, joint or saw cut line rather than completely different materials on public and private property. Consider coordinating a material palette with the local BIAs.

Ottawa, ON

Ottawa, ON

Ottawa, ON

P12.11 Extend the contiguous surface of the pedestrian easement across the full property width without interrupting surface material or grade when crossing a driveway, loading bay or access ramp.

P12.12 Depending on the micro-climate conditions including sun, rain and wind, include canopies on buildings that use the setback typology to moderate impacts on the pedestrian environment.

P12.13 For Type 2 easements (cantilever/overhang), carefully coordinate the design with streetscape planting to avoid conflicts.

3.3 Cyclists (C)

Creating a safe, connected cycling network is an important part of a balanced transportation network and integral to encouraging higher bicycle ridership.

Ottawa has a large cycling network, but much of it provides scenic and touristic routes around the perimeter of downtown, and is only beginning to provide connections into downtown for commuters. A pilot project for segregated cycling lanes on Laurier Avenue West is currently underway.

While segregated cycling lanes are becoming a popular strategy for improving cyclists' sense of safety and protecting their right-of-way, there are many other options for cycling facilities to be integrated on streets. When planning for cycling facilities, it is very important to consider the relationship between type of facility comfort and inclusiveness, conflicts with other street users and conflicts at intersections, signage, adjacent land uses and its role in the overall transportation network.

C1 An Integrated Network of Cycling Routes

There are five types of cycling facilities which together create an integrated network of bicycle routes:

Type 1: Off-street Facilities

(image source: CC David Carroll)

Type 2: Shared Spaces

Type 3a: Separated Facilities (Segregated)

(image source: CC Richard Akerman)

Type 3b: Separated Facilities (Dedicated Lanes)

(image source: CC Flickr user karmacamilleeon)

Type 4: Shared Lanes

(image source: CC Eric Gilliland)

The following table provides a summary of the typology of bicycle facilities:

Type	Subtype	Other names	Infrastructure	Interaction with Other Users (non-cyclists)	Inclusiveness	Best Application
Type 1: Off-Street Facilities	Multi-Use Pathway	Pathway Trail	Paved pathway Stone-dust pathway	High	Inclusive to cyclists of all ages and abilities	Off-street pathway shared by pedestrians and cyclists, green spaces
Type 2: Shared Spaces	Car Free Street	Pedestrian street Plaza street	Single surfaces Chicanes, furniture, planters	High	Inclusive to cyclists comfortable with mixing with pedestrians at low speeds	Narrow downtown commercial streets
	Woonerf	Shared space Home zone (UK)		Moderate to high	Inclusive to cyclists comfortable with mixing with pedestrians and vehicles at low speeds	Narrow, low volume residential streets with extensive traffic calming
Type 3a: Separated Facilities (Segregated)	Unidirectional	Segregated bicycle lane Separated bicycle lane Bicycle track On-road bicycle path Raised bicycle path Sidewalk-level bicycle path	Lateral separators (curbs, bollards, parked cars) Raised surface Road markings and signage at intersections	Low	Inclusive to cyclists comfortable with some level of interaction with vehicle traffic, particularly at intersection	Arterials with high traffic volume or high traffic speeds
	Bidirectional	On-road bicycle path Raised bicycle path Sidewalk level bicycle path Transportation path				Arterials with high traffic volume or high traffic speeds
Type 3b: Separated Facilities (Dedicated Lanes)	Standard Cycling Lane	Bike lane Bicycle lane	Painted lines or differentiated surface material or colour Road markings and signage at intersections	Moderate	Inclusive only to cyclists comfortable with the level of stress associated with travelling in close proximity to vehicle traffic	Arterial or collector streets with moderate traffic volume and speed
	Contraflow Cycling Lane	Counter-flow bike lane Counter-flow bicycle lane				One-way, one-lane streets with moderate traffic volume and speed
Type 4: Shared Lanes	Shared Lane	Shared road Designated bicycle route	Road markings and signage at intersections	Moderate to high	Inclusive only to cyclists comfortable with the elevated level of stress associated with sharing lanes with vehicle traffic	Low volume, low speed streets (preferably traffic calmed)
	Shared Bus Lane	N/A				Transit malls, streets with reserved bus lanes
	No Facility	N/A	None			Low volume, low speed streets (preferably traffic calmed)

Figure 3-4: Summary of the typology of bicycle facilities.

C1.1 Type 1: Off-Street Facilities

Off-street facilities, or multi-use pathways, are commonly found across Ottawa, and offer the highest degree of separation from vehicle traffic. In Ottawa, multi-use pathways are typically recreational paths shared by cyclists and pedestrians along natural corridors and/or linking key destinations.

Placement

Pedestrians and cyclists share the same surface.

- Pedestrians have highest priority, followed by cyclists.

Separated from the roadway by at least 1.5 m with a vegetation buffer or physical barrier.

Width

Minimum unobstructed travel area of 3.0 m.

- Allows only one bicycle to pass at a time.
- Cyclists must yield to pedestrians.

Adjacent clear zone of 1.5 m of each side of the pathway.

Vertical clearance of 4.0 m.

C1.2 Type 2: Shared Spaces

Shared Spaces are where cyclists share the same space as other road users, mostly pedestrians. Pedestrians, cyclists, and vehicles share the same surface.

Shared spaces can be either car free streets or Woonerfs. Both have similar characteristics in terms of providing cyclists a moderate to high degree of comfort at low speeds.

Car-Free Streets

Placement

A car-free street is any street segment on which most motorized vehicle travel is prohibited. Exceptions may include emergency and delivery vehicles. Sparks Street and portions of William Street (in the ByWard Market) are examples of car-free streets in Ottawa. Today, none of those streets allow cycling. However, there are opportunities to introduce cycling on car-free streets in the future.

- May be a conventional street, consisting of a roadway and raised sidewalks, or a specially surfaced street, consisting of single surface with no differentiation between roadway and sidewalk.

Woonerfs

Placement

A woonerf is a street with very low speed limits where pedestrians, cyclists, and automobiles share the same surface. On-street space is not specifically allocated to each type of road user.

» Pedestrians have highest priority, followed by cyclists.

Extensive traffic calming to force automobiles and cyclists to move slowly

Width

Unobstructed travel area no wider than 3.5 m.

» Allows only one vehicle to pass at a time.

» Forces vehicles to move slowly

C1.3 Type 3a: Separated Facilities (Segregated)

A segregated facility is any on-street cycling facility that is either laterally separated from traffic lanes by means of a physical barrier, or vertically separated from traffic lanes by being raised above the grade of the roadway. Curbs, bollards, painted lines, painted pavement, and parked cars (or a combination thereof) are used to achieve lateral separation. Vertically separated facilities can be raised to an intermediate grade between those of the roadway and sidewalk, or to the same grade as the sidewalk. Laterally separated cycling facilities are generally less expensive to construct because they can utilize the existing roadway surface and do not entail major changes to existing drainage systems. The construction of raised (vertically separated) facilities entails creating a new surface for cyclists and may require curb-side sewers to be moved inward to continue providing drainage for the roadway.

Segregated facilities can be either unidirectional or bidirectional. Both have similar characteristics in terms of limiting vehicle-cyclist interactions, cycling speed, and comfort. Vehicle-cyclist interactions could be further limited with vehicle turn restrictions.

Ottawa currently has three segregated cycling facilities, located on Laurier Avenue, the Portage Bridge and the Alexandra Bridge.

Unidirectional

Placement

Placed directly adjacent to the sidewalk.

Parking lane can be placed between the facility and traffic lanes except the last 20 m before an intersection.

If required, bicycle lane barriers are to be temporarily removed for planned or emergency maintenance work associated with the roadway or public utilities, as per the conditions of the City's Road Activity By-law.

Width

Absolute minimum is 1.5 m.

Recommended minimum is 1.8 m.

- Allows conventional bicycles to pass each other.
- Allows snow clearing with standard sidewalk equipment.

Current Danish standard is 2.5 m.

- Allows tricycles and cargo bicycles to pass each other.

0.5 m or wider buffer strip required if parking allowed in adjacent lane.

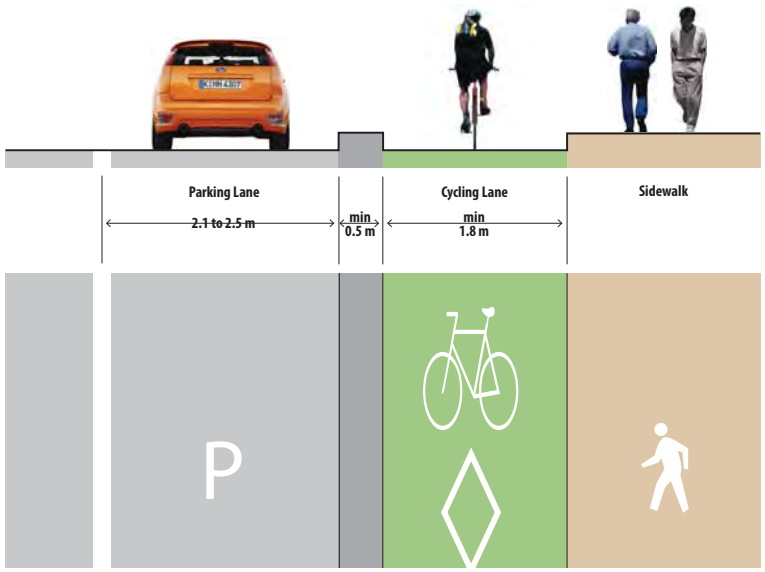


Figure 3-5: Unidirectional laterally separated facility with parking

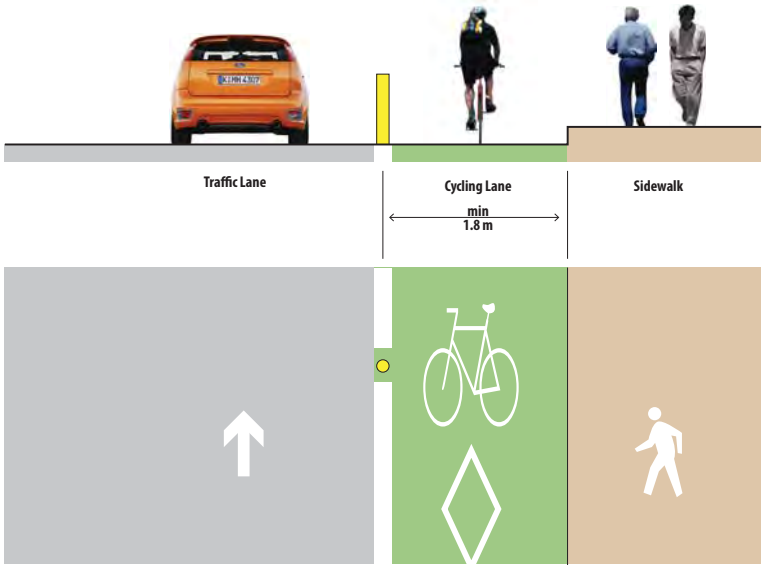


Figure 3-6: Unidirectional laterally separated facility without parking

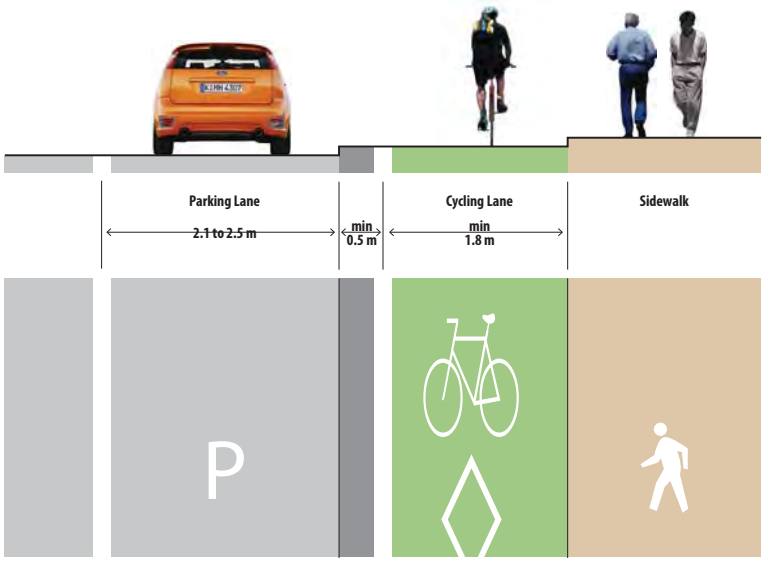


Figure 3-7: Unidirectional vertically separated facility with parking

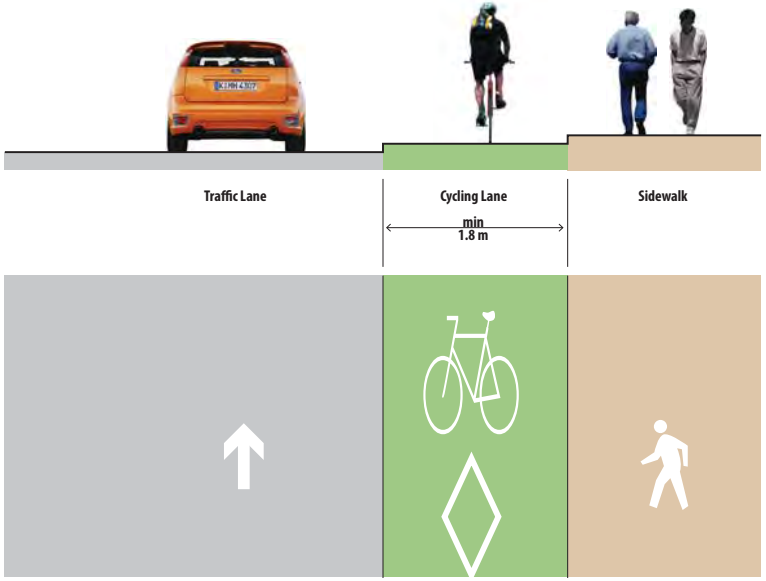


Figure 3-8: Unidirectional vertically separated facility without parking

Bidirectional

Placement

Placed directly adjacent to the sidewalk.

Parking lane can be placed between the facility and traffic lanes except the last 20 m before an intersection.

If required, bicycle lane barriers are to be temporarily removed for planned or emergency maintenance work associated with the roadway or public utilities, as per the conditions of the City's Road Activity By-law.

Width

Minimum required is 3.0 m (1.5 m per direction).

Opposite lane can be used to pass.

0.5 m or wider buffer strip required if parking allowed in adjacent lane.

When the outer lane of a bidirectional facility is facing a travel lane moving in the opposite direction, the facility shall have an additional vertical or physical separation buffer, space permitting.

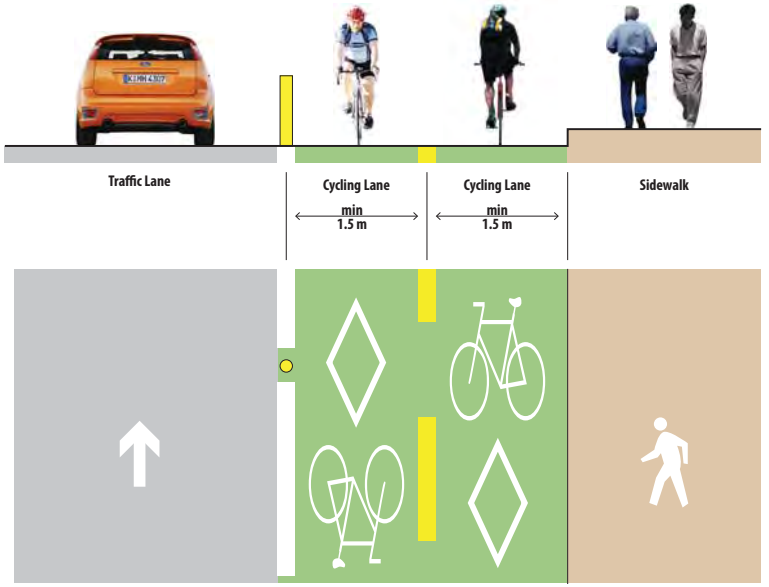


Figure 3-9: Bidirectional laterally separated facility without parking

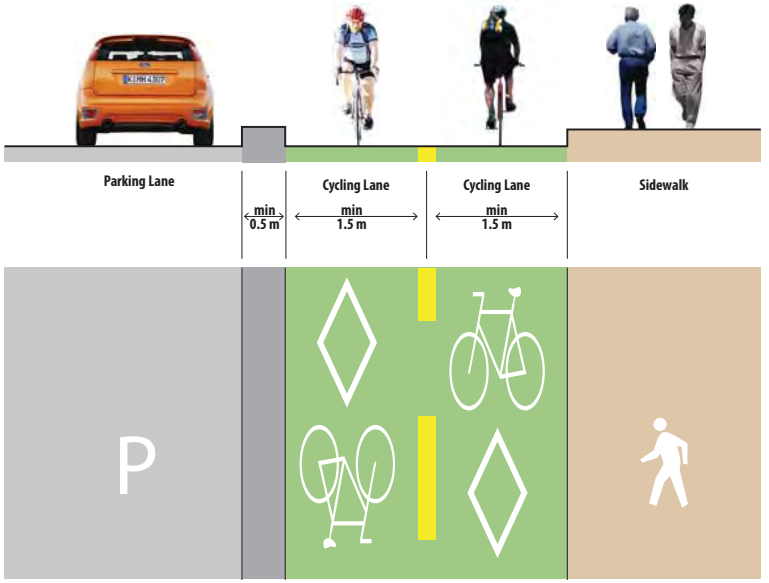


Figure 3-10: Bidirectional laterally separated facility with parking

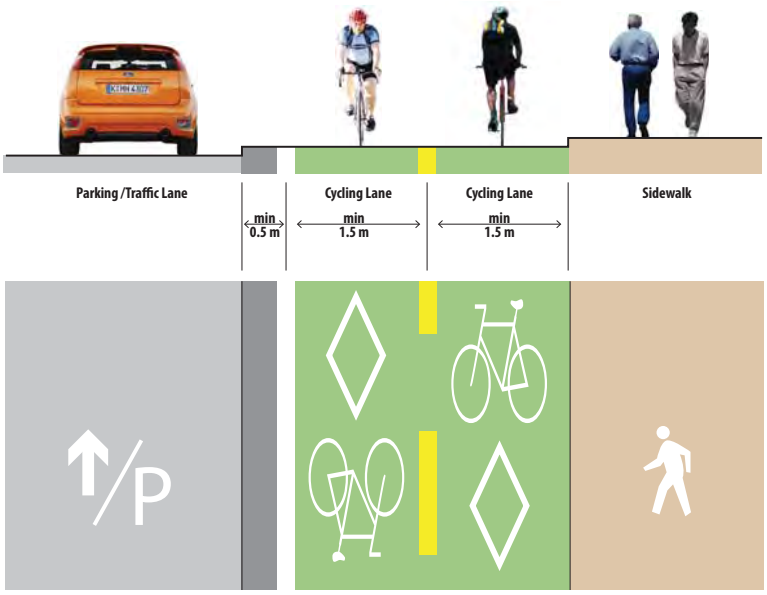


Figure 3-11: Bidirectional vertically separated facility

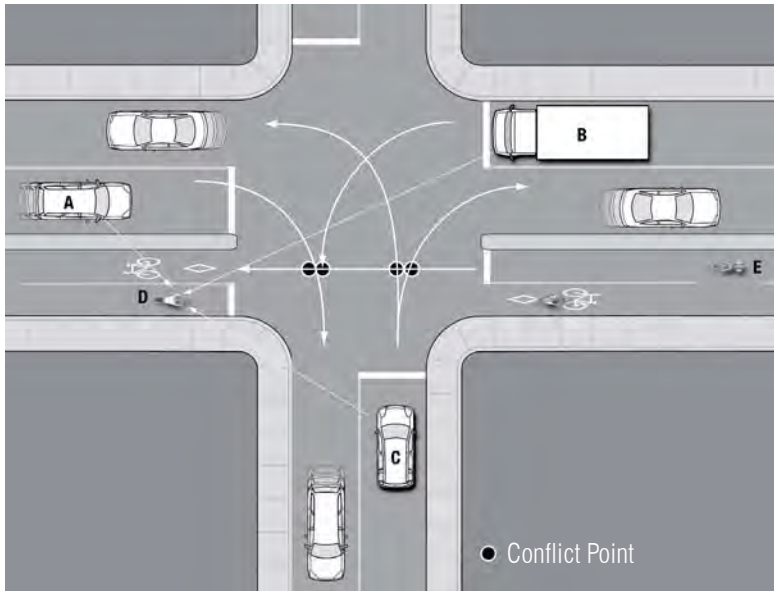


Figure 3-12: Possible bicycle-automobile conflicts at an intersection on a two-way street with a bidirectional segregated bicycle facility Source: Planning and Design for Pedestrians and Cyclists, Vélo Québec Association (2010)

Figure 3-12 shows four potential conflict points, making the combination of bi-directional cycling lanes on bidirectional streets unsafe for road users. However, bidirectional cycling facilities can be acceptable on streets with widely spaced intersections, limited number of private entrances, and no parking within the required sight triangle for motorists and cyclists. Turn restrictions for vehicles should be studied for streets with bidirectional cycling facilities to reduce potential conflict points.

C1.4 Type 3b: Separated Facilities (Dedicated Lanes)

Dedicated bike lanes are separated from traffic lanes by means of painted lines on the roadway. They are typically in the form of standard bike lanes, which are unidirectional running in the same direction as the adjacent traffic lane. It is also possible to implement a dedicated bike lane running in the opposite direction (contraflow bike lane) in order to allow two-way cycling travel on a one-way street.

Dedicated bike lanes in downtown Ottawa are found along Bay Street, Lyon Street, and on the Mackenzie King Bridge.

Standard Bike Lane

Placement

Can be placed directly adjacent to the curb or adjacent to a parking lane.

Usually placed on the right side of a one-way street but can be placed on the left side to avoid conflicts with bus stops along major transit corridors.

Width

Minimum is 1.5 m.

» Passing possible through use of adjacent traffic lane

Recommended width is 1.8 m.

» Allows passing within the cycling lane.

» 0.5m or wider buffer strip can be implemented.

Contraflow Bike Lane

Placement

Can be placed directly adjacent to the curb or adjacent to a parking lane.

Width

Minimum is 1.5 m.

» Passing possible through use of adjacent traffic lane.

Recommended width is 1.8 m.

» Allows passing within the cycling lane.

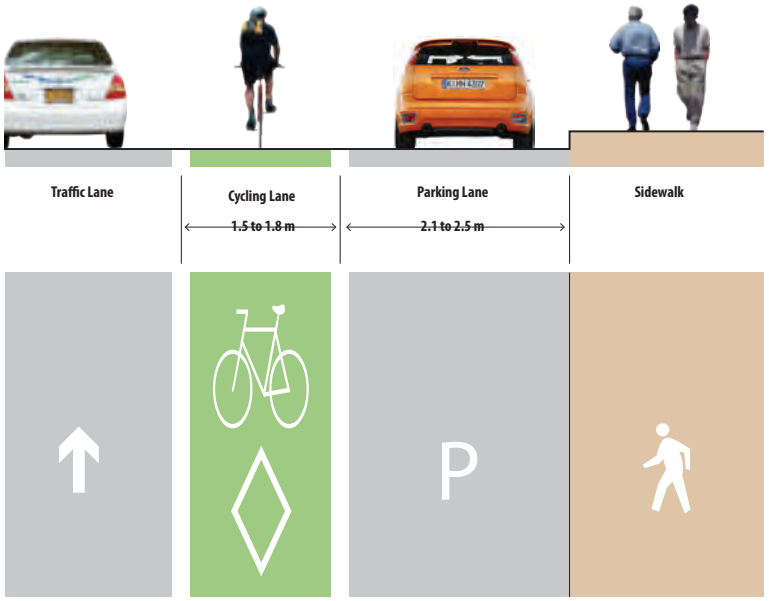


Figure 3-13: Standard bike lane

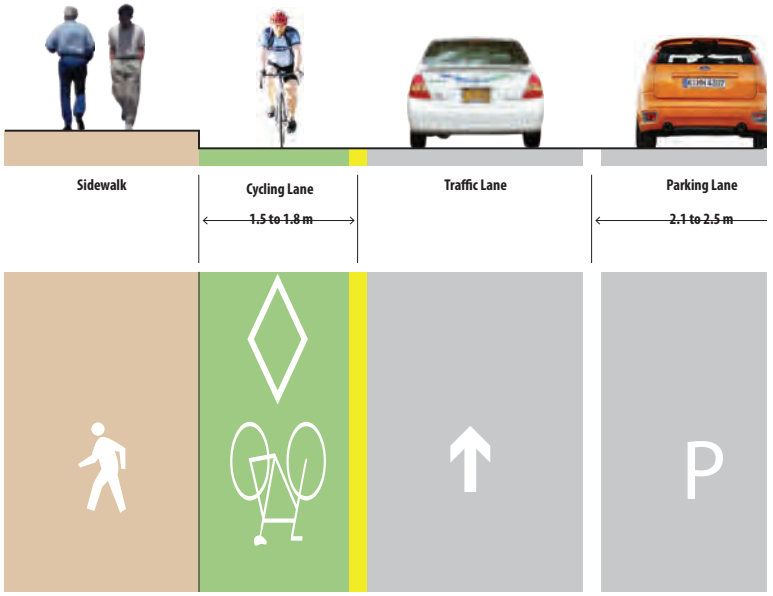


Figure 3-14: Contraflow bike lane

C1.5 Type 4: Shared Lanes

A shared lane is any roadway or part thereof that is to be shared by cyclists and motor vehicles. Shared facilities are generally designated as cycling routes and have signage to direct cycling traffic. The shared lanes may either be standard width or wide.

Standard, designated shared lanes are standard width lanes intended to be shared any class of vehicle and cyclists. It is also possible to designate reserved bus lanes for use by cyclists.

Wide shared lanes provide additional width to enable cyclists and vehicles to travel "side by side".

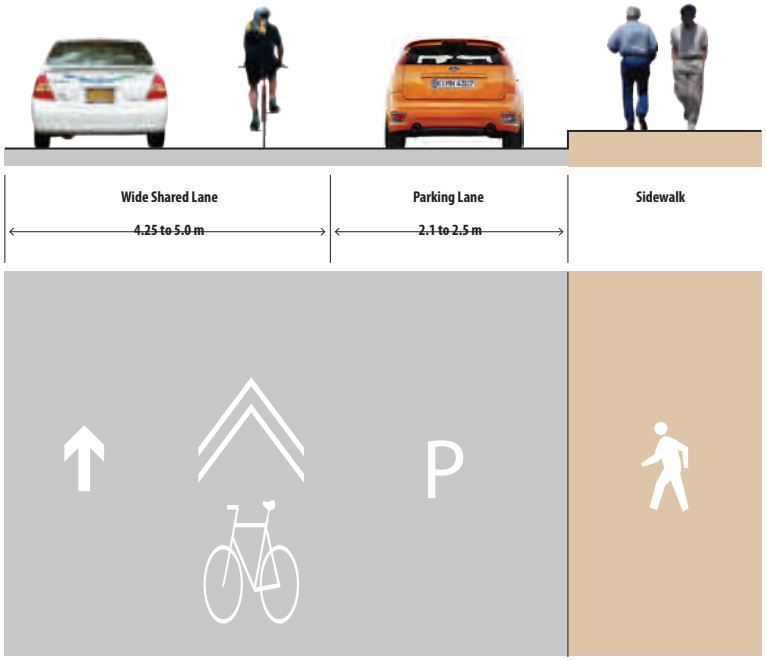


Figure 3-15: Wide Shared Lane

Shared facilities are the most common cycling facilities in downtown Ottawa, currently present on Queen, Bank, Rideau and Wellington Streets.

Shared Lanes

Placement

Can be placed directly adjacent to the curb or adjacent to a parking lane.

Same grade as roadway.

Width

Narrow shared lane 3.0 to 3.5 m is acceptable.

- Vehicles cannot pass cyclists.
- Vehicles and cyclists ride single file.

Wide Shared lane between 4.25 and 5.0 m is recommended.

- Sufficient clearance for cyclists and vehicles to travel side-by-side.
- Vehicles can pass bicycles safely.
- Can accommodate "sharrows".

Shared lane over 5.0 m not recommended.

- Vehicles may attempt to fit in side-by-side, squeezing or blocking cyclists.
- May promote excessive vehicle speeds.

Sharrows

Place immediately after an intersection and 10 m before the end of a block.

Space longitudinally at intervals of not greater than 75 m, but use judgement in most applications (Bikeway Guidelines, TAC, 2012).

Shared Bus Lane

Placement

Usually implemented in the curb lane.

Width

Recommended minimum is 4.5 m.

» Allows buses to pass cyclists within the lane.

No Facility

Placement

Any lane on any road except divided highways can be used by cyclists.

Width

Not applicable.

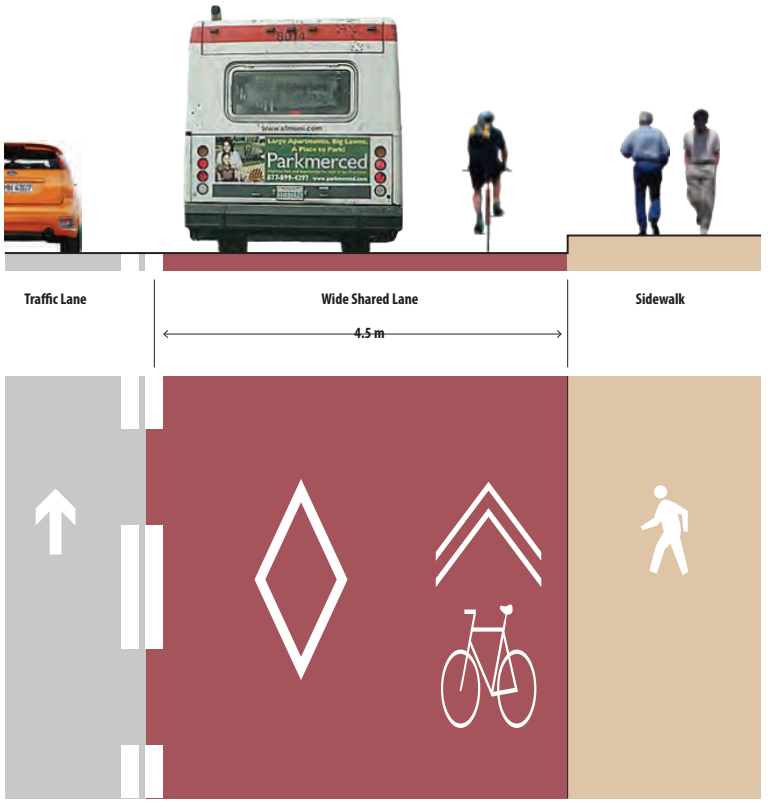


Figure 3-16: Designated Shared Bus Lane

C2 Safe, Prioritized Intersections

Intersections are primary points of conflict between cyclists and vehicles and pedestrians. Safe, prioritized intersections are essential to the overall safety of the bicycle network.

C2.1 Improve cyclists' visibility at intersections with advance stop lines that are located in front of vehicle stop lines.

C2.2 On routes with significant bicycle traffic, provide bike boxes and left turn pockets at suitable intersections to allow cyclists to move in front of stopped vehicle traffic at a red light. Cyclists are therefore more visible to motorists, can take advantage of priority left-turn phases, and are less exposed to exhaust from idling cars.

C2.3 At intersections equipped with push-button activated signals, position switches near enough to the curb edge to allow cyclists to operate them without dismounting. Alternatively, where possible, include in-pavement activation sensors.

C2.4 Restrict rights turns at a red light at appropriate intersections to reduce conflicts between motorists and cyclists.

C2.5 Protect cyclist's route through the intersection by use of road markings indicating the cycling facility as it crosses intersection.

C2.6 Two-phase crossings are an option to be considered.

Vancouver, BC (source: CC Paul Krueger)

Ottawa, ON (source: CC Richard Akerman)

C3 Plentiful & Easy to Find Bicycle Parking & Amenities

It is essential to develop bicycle parking and related amenities to further encourage cycling. The facilities should address the distinct needs of cyclists accessing shops and services in downtown Ottawa and those of commuting cyclists.

C3.1 Place bicycle parking facilities in highly visible locations near Confederation Line station entrances. As indicated by the Pedestrian/Cycling Study and Design Approach (OLRT, 2011), stations should have the following numbers of bicycle spaces:

- Minimum of 8 bicycle spaces at Downtown West Station;
- Minimum of 16 bicycles spaces at Downtown East Station; and,
- Minimum of 8 bicycle spaces at Rideau Station.

The above numbers are designed with flexibility. When bicycle parking capacity is met, introduce more parking.

C3.2 Convenient short-term bicycle parking should be available less than 15m, but no more 50m, from the cyclist's destination. It should be placed along sidewalks or other highly visible public locations so that it can be easily found and to discourage theft.

- Place bicycle parking in on-street automobile parking stalls where pedestrian traffic is high and sidewalk space is limited. This arrangement (Figure 3-18) can be removed during winter months;
- Place post-and-ring type bicycle stands on sidewalks along the curb zone. Distribute them at regular intervals, cluster more post and ring racks in front of buildings with services, and allow residents/ businesses to suggest additional locations; and,
- Adapt street furniture, such as signposts and lampposts for use as bicycle parking (Figure 3-17).

Figure 3-17: Adapting street furniture for bicycle parking. Source: Cyclehoop Ltd.

Figure 3-18: Bicycle stands in parking stalls. Source: Christopher DeWolf (left).

Figure 3-19: Examples of public bicycle parking signage. Source: OFROU 2008.

C3.3 The City of Ottawa Zoning By-law (2008-250, Part 4, Section 111) requires that off-street bicycle parking be provided based on the following:

- One bicycle parking space for every 250 m^2 of gross floor area for office and retail uses under 8,000 m^2;
- One bicycle parking space for every 500 m^2 of gross floor area for libraries, municipal services, and retail uses over 8,000 m^2 , including shopping centres;
- Bicycle parking spaces should be located to provide convenient access to main entrances or well-used areas;
- If 50 or more bicycle spaces are required, a minimum of 25% should have the following security features: be housed in a building or structure; be located in a secure area such as a supervised parking lot or enclosure with secure entrance; be bicycle lockers; and,
- Motor vehicle parking requirement should be reduced by one motor vehicle parking space for every 13 m^2 of gross floor area provided as shower rooms, change rooms, locker rooms and other similar facilities intended for the use of the bicyclists.

As the Zoning By-law requirements only apply to new development in the Study Area, the following measures are recommended to increase long-term bicycle parking on private properties:

- Develop exemplary long-term bicycle parking facilities at City-owned and occupied buildings;
- Work with federal building managers to develop bicycle parking for government employees;
- Provide resources to help building owners/managers to implement appropriately designed and located bicycle parking;
- Apply the updated bicycle parking requirement retroactively to all existing properties with grace period for compliance; and,
- Provide incentives for additional bicycle parking, such as reduced minimum car parking spaces.

C3.4 Off-street, secure and long-term bicycle parking in the Study Area should be developed and accessible to the general public. Bicycle parking within public and private parking garages could be provided. It is essential that wayfinding signage be installed on streets in the vicinity of any indoor public bicycle parking to direct cyclists to these facilities (Figure 3-19). The location of secure, indoor public bicycle parking facilities should be indicated on bicycle maps.

Another approach is to provide a dedicated bicycle parking facility, a so-called “bike station”, at one of the Confederation Line stations in downtown Ottawa. There are three distinct clienteles who could benefit from the existence of such a facility:

- Bicycle commuters without access to a private long-term parking facility;
  - Employees in small buildings (e.g., on Sparks Street).
  - Park bicycle for duration of workday.
- Outbound transit customers;
  - Residents of the study area and its environs.
  - Use bicycle to travel between home and transit.
  - Park bicycle for duration of workday.
- Inbound transit customers;
  - Employed in the study area and its environs.
  - Use bicycle to travel between transit and work.
  - Park bicycle overnight.

Given that sidewalk space is already limited and that the development of the Confederation Line will further increase pedestrian traffic, it is recommended that the bicycle station be developed off-street, preferably in a storefront close to an Confederation Line station head (Figure 3-20).

It is recommended that the bicycle station should have the following features:

- Electronically-controlled access;
  - For registered users only.
  - Entry means of dedicated electronic key or future smartcard transit pass.
  - Accessible 24/7.
- Passive security features;
  - Ample fenestration.
  - Bright illumination.
- Active security features;
  - Camera surveillance.
  - Motion detectors.
- Two-tier bicycle racks (Figure 3-21) for optimal space usage;
- Include complementary amenities;
  - Lockers.
  - Power sockets for electrically-assisted bicycles.
  - Air pump.
  - Vending machine with inner tubes and other basic parts.
- Bathrooms;
- Showers and change rooms (optional).

Figure 3-20: Integrated Bike Station into Downtown Building. Source: Momma Wheelie Biking Blog.

Figure 3-21: Two-Tier Racks at Bicycle Stations. Sources: Tony Brock/Toronto Star (left) and BeyondDC (right).

C4 Bicycle Sharing Stations at Key Locations

Bicycle sharing programs are made available to the public through a network of self-service stations. Depending on the program, users have the option of paying into an on-site terminal or use a pre-paid membership. Users can take advantage of the service for all their mobility needs or use it in conjunction with other public transit options.

In Ottawa, two bicycle-sharing programs are currently in operation. Bixi Capitale is managed by the National Capital Commission (NCC) and has a strong presence downtown. RightBike is a community owned and operated bicycle-sharing program in Westboro and Wellington West.

C4.1 Ideally place bike-sharing stations is no more than 300 m apart from one another (Vélo Québec, 2010).

C4.2 Locate bike-sharing stations in close proximity to transit stations, so that users can leverage their choice of other transportation options.

C4.3 Encourage the integration of payment systems between bicycle-sharing programs and local public transit operators.

C4.4 Where space is limited, place bicycle stands in existing on-street parking spaces.

Ottawa, ON

3.4 Transit (T)

A fast and comprehensive transit network is a very important element to enable the efficient and continuous movement of large flows of people across downtown Ottawa. As Ottawa grows economically and physically, more demand will be placed on the provision of transit.

T1 Efficient & Reliable Bus Transit

Buses will remain an important mode of transport in downtown Ottawa, even after the opening of the new Confederation Line in 2018. Local buses will continue to provide access to/from communities adjacent to downtown Ottawa (e.g. Lowertown, The Glebe), to/from Gatineau, and to/from the Confederation Line.

T1.1 Downtown streets must allow efficient movement of buses to support future growth and increased transit mode share objectives, balanced against the need to accommodate pedestrian, cycling, goods movement and automobile use.

T1.2 For streets identified in the City's Transportation Master Plan as future Transit Priority Corridors, employ operational and physical measures to improve the efficiency and reliability of transit service along those streets.

T1.3 Locate bus transit timepoints outside of the downtown area and maintain some provisions for bus lay-bys downtown.

T1.4 For safety reasons, provide a 0.6 m visual warning/detection tactile strip at the edge of the sidewalk, where the bus stop is located.

T1.5 Design curb-side transit stop loading areas to be minimum 3.0 m wide to ensure accessibility is afforded to all transit customers.

T1.6 Incorporate surface texture changes at transit stops to assist the visually challenged in locating the stop and/or shelter location.

T1.7 Include Bus Priority measures in physical road design and signalization.

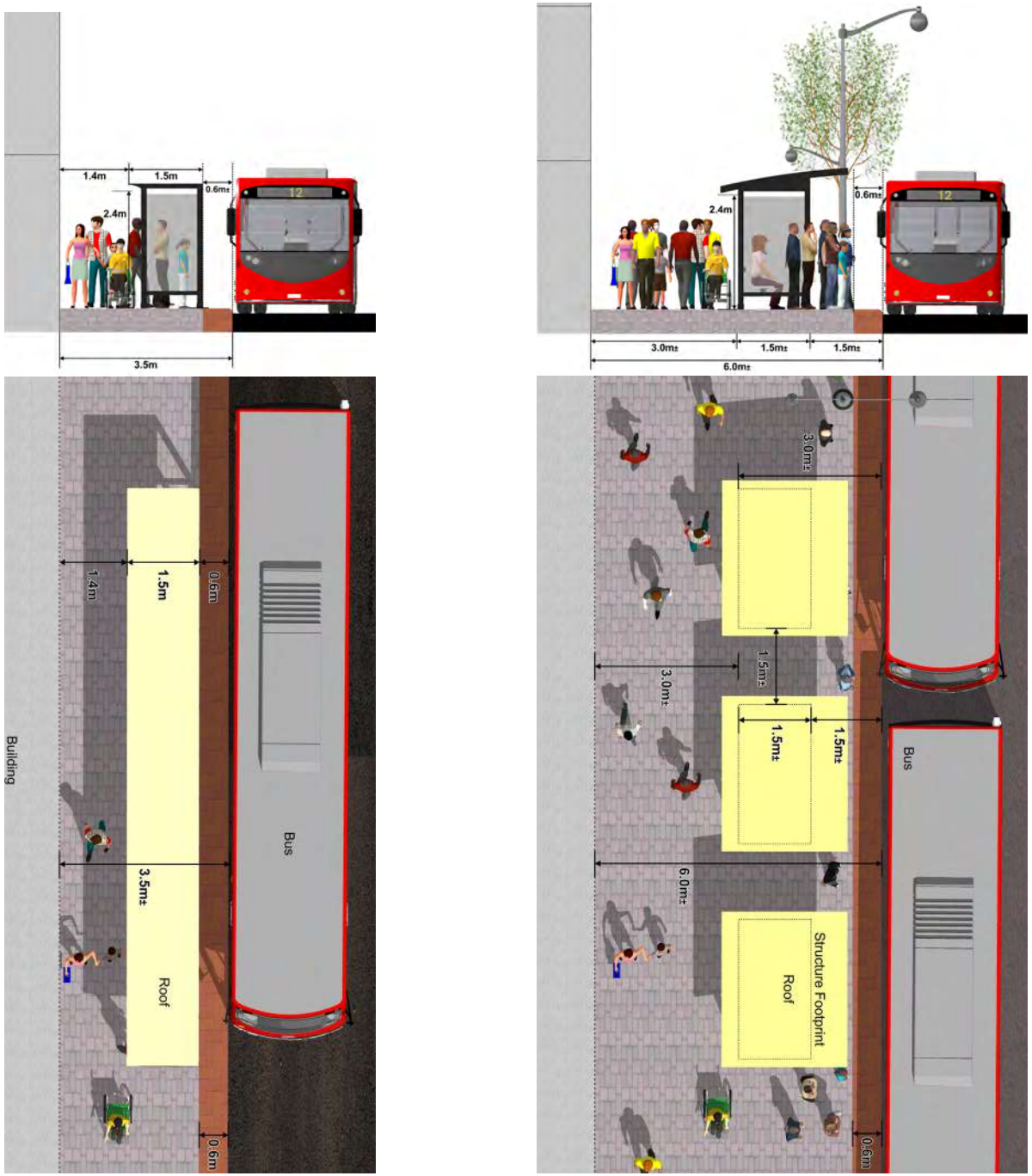


Figure 3-22: Transit shelter arrangements

The illustrations in Figure 3-22 show potential transit shelter arrangements on sidewalks with different widths. The first illustration provides an arrangement where sidewalk space is limited to a total of 3.5m or less. In this scenario, the preferred solution is to integrate the bus shelter with the adjacent building through agreements with the building owners. If this is not possible, a narrow bus shelter, with the shelter opening facing away from the street is acceptable. The second illustration shows a scenario suitable to downtown bus platforms and to be applied to Bus-Confederation Line interface blocks, as indicated in the Vision Plan for Transit Mobility (Section 2). An enclosed bus shelter is accommodated on 3.0m of the sidewalk, enabling a 3.0m pedestrian zone. Both illustrations show a 0.6m visual warning/tactile detection strip at the edge of the sidewalk.

T2 Optimized Connectivity Between All Modes and Confederation Line Stations

Local bus routes within downtown Ottawa will provide connections with planned Confederation Line stations to support transit access and mobility for residents and visitors within the downtown area and across whole city. The final location of the planned Confederation Line stations and their entrances at street level may result in the need for transit priority measures on other streets to ensure strong connections between local and rapid transit services.

T2.1 Connections must be made as convenient and efficient as possible and walking distances minimized in order to accommodate large volumes of transit customers and buses at key locations in downtown Ottawa.

T2.2 When possible, connect local bus stop and Confederation Line station entrance on the same side of the street.

T2.3 Station entrances and connecting bus stops must be clearly identifiable and include appropriate way-finding to transit customers.

T2.4 Sufficient curb space must be available at connecting bus stops to accommodate frequent local bus service.

T2.5 Sidewalk space at bus stops serving as connections to Confederation Line stations must be designed to allow efficient passenger flow and minimize conflicts between transit customers and other pedestrians.

T2.6 Provide sufficient and accessible sheltered waiting space and amenities for transit customers connecting between Confederation Line and local bus services to ensure a safe, convenient and comfortable experience, especially during off-peak hours.

Toronto, ON

Vancouver, BC

Vancouver, BC

London, UK

T3 Improved Integration Between Bus Stops & Bicycle Lanes

Where dedicated bicycle lanes are provided adjacent to the sidewalk, conflicts between buses and bicycles may occur due to the need for buses to cross the bicycle lane to arrive at and depart from curbside stops. In these cases, strategies to mitigate potential conflicts between buses and bicycles should be considered

T3.1 Delineate bus stop zones that overlap bike lanes with clearly identifiable markings, such as zigzag lines or a coloured stretch of pavement (Velo Quebec).

T3.2 Where a bus stop is located near-side of an intersection, demarcate the bicycle lane with broken white lines beginning 20 metres before the bus stop to allow for buses to move to curbside.

T3.3 Where a bus stop is located mid-block, demarcate the bicycle lane with broken white lines beginning 34 metres before the stop, and continuing through 15 additional metres after the stop.

T3.4 Where a painted bicycle lane runs adjacent to the sidewalk, bring it to sidewalk level at bus stops to allow passengers getting on and off the bus to easily reach the sidewalk by crossing the bicycle lane. Demarcate bus stop zones with tactile surface indicators and/or coloured paving. This particular guideline is recommended for bus stops with low transit volumes.

T3.5 Where a bicycle lane is physically separated from vehicle lanes, bring it to sidewalk level at bus stops to allow passengers getting on and off the bus to reach the curb by crossing the bicycle lane. Additionally, reserve an area between the bicycle lane and the vehicle lane that is minimum 1.0 metre wide to facilitate embarking and disembarking passengers (Velo Quebec).

Vancouver, BC (source: CC Paul Krueger)

Paris, FR (source: CC Vladimir Zlokazov)

Toronto, ON (source: CC Sean Marshall)

T4 Enhanced Bus Stop Zones & Amenities

Transit customers are also pedestrians at each end of their trip, and the transit stop is where the transition between transit and walking is made. Bus stop location, spacing and design must be carefully considered in order to provide a comfortable and enjoyable transit experience that integrates into the streetscape.

T4.1 Encourage the redevelopment of spaces adjacent to the Confederation Line stations through place-making initiatives.

T4.2 Use bump-outs or "bus bulges" to provide bus priority at transit stops and to provide more space for waiting passengers and for transit stop amenities.

T4.3 Provide transit shelters and other amenities to provide weather protected and safe waiting spaces for transit customers, appropriate to the context.

T4.4 Design "signature" bus shelters and associated signage to match the architectural quality and visual style of the Confederation Line station entrances, making them emblematic of Ottawa and contributing to street art.

T4.5 Where new development is proposed, investigate opportunities to integrate shelters and amenities through use of setbacks, overhangs, canopies, etc.

T4.6 Provide recycling and waste receptacles in proximity to bus stops, in the 1.1m utility zone as outlined in P2.1 (Section 3).

T4.7 Provide sufficient clear space along the curb at bus stops, as determined by OCTranspo, to allow efficient passenger flows and minimizing conflicts with other pedestrians.

T4.8 Where flex spaces are proposed, locate bus shelters within 3 metres of the street edge. In addition, do not place on-street parking immediately adjacent to bus shelters.

Ottawa, ON

Vancouver, BC

Paris, FR (source: CC David Fernández)

3.5 Vehicles (V)

A vibrant and economically successful downtown is supported by a cohesive and efficient road network that enables vehicle flow, provides well-located loading areas, has strategic on-street parking and offers access to off-street parking arrangements.

In addition, as downtown Ottawa houses some of the most popular touristic destinations in the National Capital Region, it is equally important to consider Tour Bus parking needs.

V1 Reduced Traffic Speeds for Safety & Comfort of Other Modes

Downtown Ottawa streets will benefit from reduced traffic speeds in order to provide for a safer and more comfortable environment for all street users. In this context, traffic calming is a term used to describe a combination of features employed to slow down traffic speeds. The main objective of traffic calming is to modify motorists' behaviour in order to improve safety conditions for everyone who uses the street. This objective is consistent with the City Council goals to create a more sustainable and liveable downtown, and rebalancing the space amongst all street users.

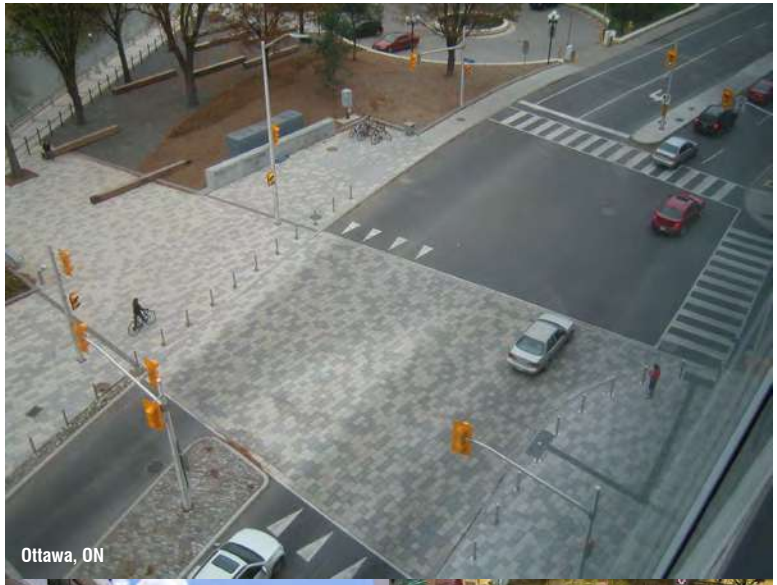
V1.1 Consider the use of raised intersections or textured cross-walks where the highest degree of traffic calming and pedestrian priority is desired.

V1.2 Employ traffic calming measures in conjunction with pedestrian priority signals to further improve the pedestrian experience at intersections.

V1.3 Where applicable, introduce physical traffic calming measures, such as speed humps, chicanes, raised crosswalks, raised intersections, traffic islands, curb extensions and full or directional closures, while addressing accessibility, emergency service vehicles, access, and vehicle mobility interests.

V1.4 Utilize non-physical forms of traffic calming measures, like edge lines, parking, and parking islands, where the right-of-way is constrained and physical space is unavailable.

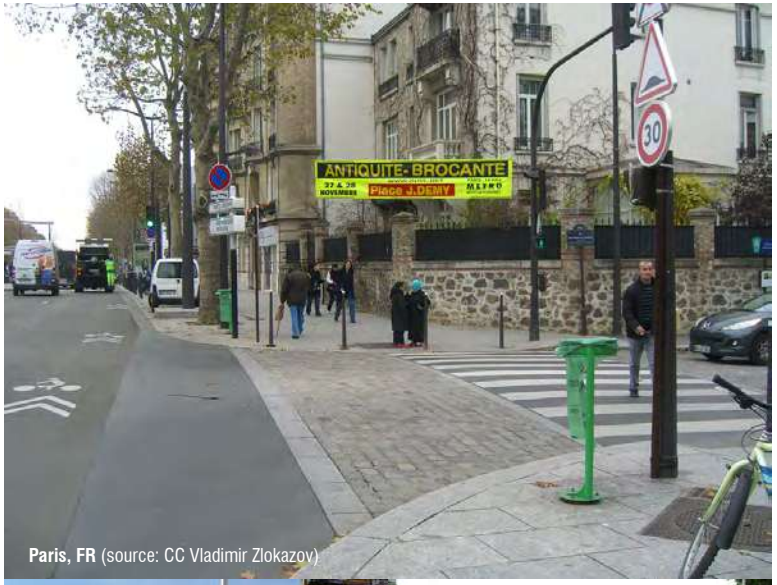
V1.5 Develop a set of key criteria to evaluate the appropriateness of traffic calming implementation in downtown Ottawa streets, or blocks of streets.



Ottawa, ON

Arcachon, FR (source: CC Henry de Saussure Copeland)

Dublin, IE (source: CC Flickr user ddartley)



Paris, FR (source: CC Vladimir Zlokazov)

Ottawa, ON

Utrecht, NL (source: CC Greg Raisman)

V2 Suitable Access for Parking, Loading, Tour Buses & Taxi Stands

Downtown Ottawa has a healthy supply of approximately 750 on-street parking spaces. On-street parking spaces have restrictions to avoid long-term parking, peak hour traffic and by-law requirements.

In 2010, the City of Ottawa transitioned from single space parking metres to multi-space Pay and Display machines. On-street parking is now identified by signage located at either end of block faces, and individual parking stalls are no longer demarcated.

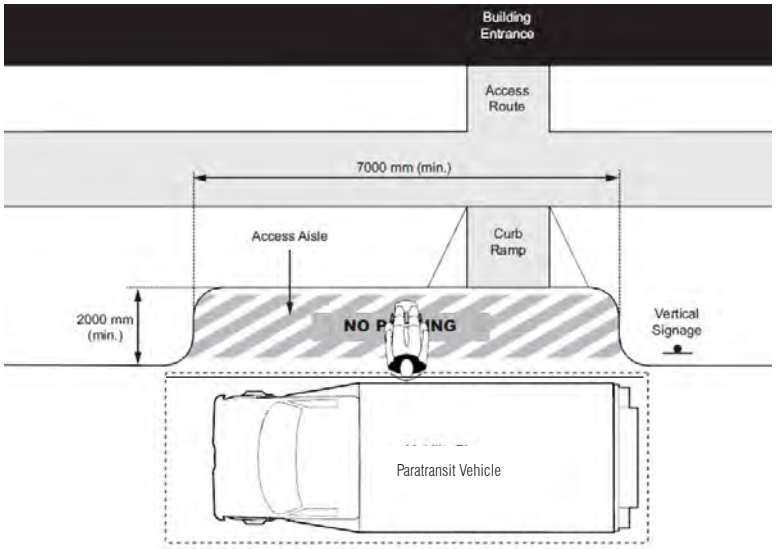
V2.1 Locate paid on-street parking at highly visible and convenient locations to serve short-term needs of local businesses.

V2.2 Provide on-street parallel parking stalls according to the following guidelines: 6 to 6.7 m long to provide maneuvering space for vehicles. Stalls at either end of a series may be as short as 5.5 m, provided there is no obstruction in front or behind the stall. Parallel parking stalls are 2.3 m to 2.7 m wide. Stalls are often wider if the parking lane is used as a travel lane during peak periods, or if the parking turnover is high. Angled parking stalls are generally denoted by lines 5.5 m long.

V2.3 Where designated on site loading zones cannot be accommodated, explore the use of on-street parking areas as loading zones at off-peak hours. Loading zones are vital in the downtown core, as there are not many driveways, parking lots or areas for them to pull off the road near their destination to supply local businesses.

V2.4 Provide loading zones and lay-by areas to measure 2.4 m wide to accommodate a wide range of personal and commercial vehicles. The length of the loading zone/lay-by is determined by the projected vehicle usage and local demand for on-street parking.

V2.5 Consider allocating passenger loading and drop-off curb space along the street where possible, providing a side aisle at least 7 metres in length and 2 metres in width adjacent to the vehicle pull-up space in order to facilitate passenger loading and unloading. Delineate the side aisle with diagonal pavement markings to indicate that it is not a space for parking, and provide at least one curb ramp leading to the sidewalk.



Source: Accessibility Design Standards, City of Ottawa, November 2012

V2.6 Provide taxi zones in close proximity to offices, hotels and restaurants. Taxi zones follow the same guidelines as stated for the above noted loading zones.

V2.7 Review the existing Tour Bus on-street parking, loading and pick-up/drop-off zones in downtown Ottawa and develop a cohesive strategy to address future Tour Bus parking considerations.

V2.8 At Tour Bus on-street and/or loading areas, consider painting the curb with a different colour to deter other vehicles from illegally occupying the dedicated Tour Bus space.

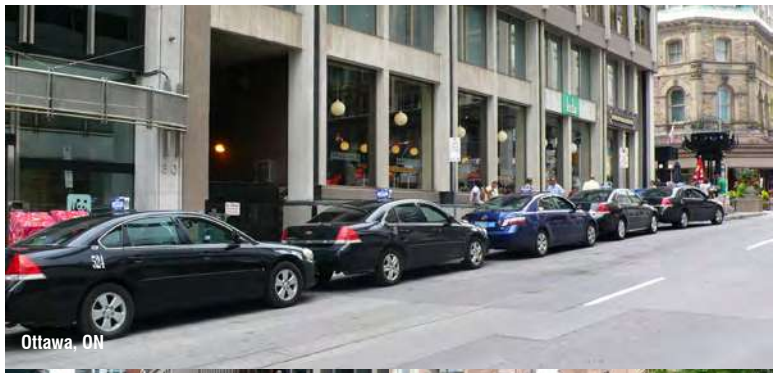
V2.9 Upgrade on-street meters for Tour Bus zones so that payment can be completed with a credit card and payment receipts are provided.

V2.10 Make the City of Ottawa's "24-hour Tour Bus Parking Permit" available for purchase on-line.

V2.11 Promote the use of car-sharing programs by encouraging building owners to locate car-share spaces in their parking areas through the development review process.

V2.12 Locate car-sharing spaces in parking areas in close proximity to Confederation Line stations.

Ottawa, ON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Ottawa, ON

V3 Adequate Capacity & Level of Service

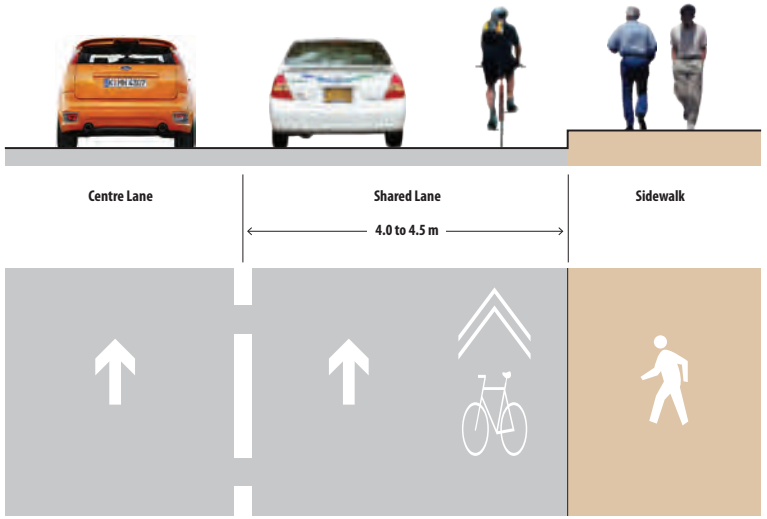
According to the Geometric Design Guide for Canadian Roads published by the Transportation Association of Canada (TAC), there is a hierarchy of urban roads that include local, collectors, arterials and freeways. Each type of street has specific lane requirements in order to meet its vocation.

V3.1 Accommodate local, collector and arterial roads in urban areas according to the following daily traffic volumes:

- Local – between 1,000 and 3,000 vehicles per day
- Collector – between 8,000 and 12,000 vehicles per day
- Arterial (minor) – between 5,000 and 20,000 vehicles per day
- Arterial (major) – between 10,000 and 30,000 vehicles per day

V3.2 Design collector and arterial lane widths as follows:

- General purpose lanes:
  - Curb lanes – 3.5 m
  - Median lanes – 3.25 m
  - Turn lanes – 3.0 to 3.25 m
- Shared-use lanes – 4.0 to 4.5 m



Level of Service Considerations

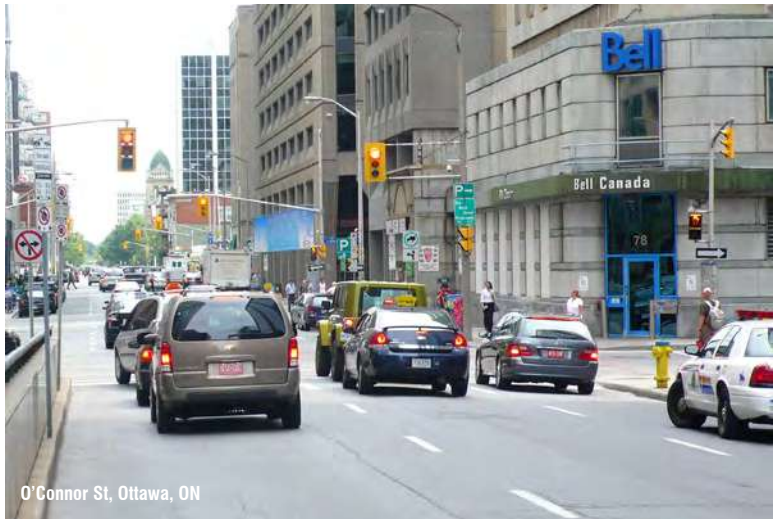
The Level of Service (LOS) of an intersection is a qualitative measure of capacity and operating conditions and is directly related to vehicle delay or volume-to-capacity (v/c) ratio. LOS is given a letter designation from A to F, with LOS A representing very good performance and LOS F representing very poor performance often indicative of extensive queuing and long delays.

V3.3 Maintain a v/c ratio of 1.0, or LOS E, for the Central Area. By accepting a significantly low LOS, other modes of transportation such as walking and cycling are prioritized over driving, and has the effect of reducing automobile dependence (source: City of Ottawa Transportation Master Plan).

Level of Service (LOS)	Volume to Capacity Ratio
A	0 to 0.60
B	0.61 to 0.70
C	0.71 to 0.80
D	0.81 to 0.90
E	0.91 to 1.00
F	> 1.00

V3.4 Outside of the Central Area, endeavor to maintain a maximum v/c ratio of 0.9 for mixed traffic at signalized intersections during weekday peak hours, corresponding to LOS E. This will help to relieve potential traffic congestion (source: City of Ottawa Transportation Master Plan).

V3.5 When calculating vehicle LOS, ensure that the desired pedestrian LOS is met first (refer to P1).



O'Connor St, Ottawa, ON

Turn Lane Considerations

According to the Geometric Design Guide for Canadian Roads, when the number of turning vehicles at an intersection is such that it creates hazards or reduced capacity to the intersection (i.e., queue spill-back), then volume and safety warrants are used to determine if auxiliary turn lanes are appropriate.

V3.6 Consider the interaction of vehicles with pedestrian crossing demands. At intersections with heavy pedestrian crossing, minimize pedestrian crossing distances and auxiliary turn lanes are not recommended. This will enhance safety for pedestrians.

V3.7 Provide a dedicated right turn lane when the right-turning traffic is 10% to 20% of the total approach volume. The potential traffic congestion generated from the lack of turn lanes can increase air and noise pollution and create unfavourable conditions for other street users.

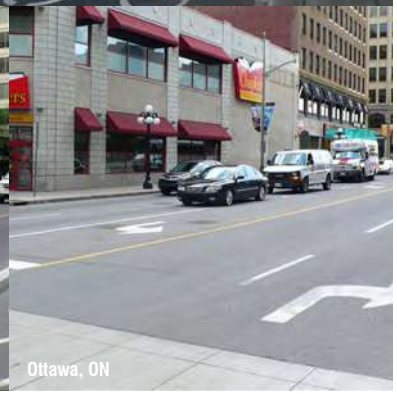
V3.8 Consider implementing a left turn lane when the magnitude of interference is unacceptable with respect to the opposing volume, the advancing volume and the percentage of left turn vehicles.

V3.9 Employ a 38m left turn storage lane at signalized intersections when applicable, but judgement is needed as urban conditions may not provide this space.

V3.10 Where possible, discourage dual turn lanes in order to create a safer and accessible environment for pedestrians.

Ottawa, ON

Ottawa, ON


Ottawa, ON

V4 Balanced Network of One-way & Two-way Streets

There are no technical guidelines available regarding the provision of one-way versus two-way streets. The literature suggests that there are opportunities and constraints associated with each. The real question as applied to Ottawa is how can the narrow rights-of-way (18m) best be utilized to function as complete streets. The following considerations are appropriate for downtown Ottawa streets:

V4.1 One-way streets generally promote efficient vehicle travel by accommodating heavy traffic volumes and improved opportunity for traffic signal coordination between intersections. They offer an opportunity to reallocate more space towards sidewalks and/or cycling facilities, allowing for development of complete streets.

V4.2 Benefits associated with one-way streets include decreased congestion, associated reduction in air pollution, reduced time delays for all modes, reduced pedestrian/cyclist conflicts with turning vehicles, increased safety at intersection crossings.

V4.3 Two-way streets generally promote increased accessibility to local destinations, desirable slower traffic speeds, and more comfortable street environment for pedestrians and cyclists. They benefit street-oriented land uses at grade level, provide scenic views from both directions and tend to calm down traffic speeds.

V4.4 Evaluate the interaction between the existing one-way street road network in downtown Ottawa with key elements of the regional transportation network, including the Highway 417 on and off ramps, access to the interprovincial Portage and Alexandra bridges and crossings over the Ottawa River.

O'Connor St, Ottawa, ON

Bank St, Ottawa, ON

V5 Safe Interaction Between Vehicle Access Points & Sidewalks

The intersection of a sidewalk with a building/parking garage entrance is a primary point of conflict between pedestrians and delivery trucks, large vehicles or other vehicles trying to access an off-street parking garage entrance or indoor loading area. Provisions to mitigate potential conflict where garage entrances meet sidewalks are essential to the overall safety of the pedestrian and vehicle environments.

V5.1 Emphasize pedestrian safety measures where an access point to a parking garage entrance/off-street loading bay intersects a sidewalk by maintaining the sidewalk at a continuous level and adding a curb-cut to allow vehicular access through the sidewalk.

V5.2 Utilize the same paving materials of the sidewalk across the driveway/access to accentuate pedestrian safety.

V5.3 If necessary, employ curbed planting zones to gently direct pedestrian traffic away from a building's loading area.

V5.4 When possible, restrict the placement of side-by-side parking garage entrances/loading accesses in order to create a safer sidewalk environment for non-motorized street users. Where more than one vehicular access point is required, consider the feasibility of designing a single access point.

V5.5 Consider the interaction between cycling facilities adjacent to off-street parking garage entrances, loading areas or truck access points.

V5.6 Where possible, integrate loading and servicing into the building envelope to minimize impacts on pedestrian areas.

V5.7 Where loading and servicing cannot be integrated into the building, screen the area from view using gates, planting or other architectural elements.

Amsterdam, NL (source: CC Erwyn van der Meer)

This section of the Street Design Toolkit provides a series of cross-sections for complete and inclusive streets that will guide street design decision-making in downtown Ottawa. The designs strive to achieve the Vision and Strategic Directions set out in Section 2, recognizing the potential of the investment in the City's light rail transit project to trigger and enable a transformation of downtown. The design solutions also have regard for the detailed design guidance of the Street Design Toolkit, and the street typology shown on the Plan of Streets (Figure 2-1).

Balancing the competing interests for space is always the number one challenge when designing complete streets. In downtown Ottawa, this competition is fierce, due to the volume of travel in all modes that must be accommodated within municipal street right-of-ways that are extremely narrow. As demonstrated in the detailed right-of-way analysis provided in Appendix D, the predominant right-of-way width is 18.3m. This corresponds to the traditional land survey width of 60 feet. Whereas some streets have wider right-of-ways (such as Laurier, Rideau, Elgin, Wellington), it is sensible to create street design solutions that can fit within the narrow 18.3 right-of-way that cover most of downtown Ottawa.

To address this challenge, the City has placed a high priority on walking, cycling, and transit use downtown. This in turn creates opportunity to reduce the amount of space allocated today for automobile travel. Smart choices can be made to create wider sidewalks and cycling facilities on many downtown streets. In the case of sidewalks, the City will take a contemporary view of the Level Of Service (LOS) requirements of pedestrian movements, and will consider various classes of sidewalks that are calibrated to their capacity requirements. The resulting sidewalk classification system for downtown Ottawa is provided in Figure 3-23 (opposite).

Within this context, the following targets are established for the design of complete streets in downtown Ottawa:

1. Sidewalk Capacity Level of Service: Sidewalks will provide for Level of Service (LOS) C, meaning that pedestrians will need to frequently adjust their path to avoid conflict, but that speed and ability to pass slower pedestrians will not be restricted.

2. Municipal Sidewalk Width: Municipal sidewalks on any downtown street will have minimum width of 3m, which provides adequate space for a utility zone (including street lights, trees, bike racks, fire hydrants, pay/display boxes), a frontage zone, and sufficient space for unencumbered pedestrian travel. [Note that in Downtown Neighbourhood (residential) Streets, sidewalk width may be reduced to 2.0m if the other 1.0m is used for integrating soft landscaping on private land.]

3. Municipal Sidewalk Width at Corner Approaches: Municipal sidewalk width/capacity will either meet the minimum, or ideally increase, at the approaches to crosswalks, to accommodate pedestrian storage requirements and to sustain the Level of Service for through movements where it is needed most.

4. Municipal Sidewalk Maintenance: A minimum clear width of 1.8m shall be provided (between obstacles) for municipal sidewalk maintenance activities, to protect adjacent public and private assets.

5. Private Land Pedestrian Spaces: Opportunities to create pedestrian spaces on adjacent private land, through setbacks or easements, cannot be assumed to exist for adjoining street segments throughout the length of the street since they are acquired incrementally on a development by development basis. Such opportunities are considered as "complementary" to municipal sidewalk requirements.

	Class	Minimum Sidewalk Width	Effective Width (for unencumbered pedestrian travel)	LOS "C" Capacity	Provision of Amenity	Typical Applications
✔	1	5.0 m	3.3 m +	» 2,500 to 4,000 pedestrians per hour	» Ideal for street trees » Ample space for street furniture	» Vicinity of Confederation Line station entrances » Transit interface zones or where downtown bus platforms needed » Main Streets, Ceremonial Streets, Showcase Streets
	2	4.1 m to 5.0 m	2.3 m+	» Pedestrian 1 zones » 2,500 + pedestrians per hour	» Excellent for street trees » Ample space for street furniture	» Transit interface zones or where downtown bus platforms needed » Main Streets, Ceremonial Streets, Showcase Streets
	3	3.4 m to 4.0 m	1.6 m to 2.3 m	» Pedestrian 2 and 3 zones » 1,000 to 2,500 pedestrians per hour	» Sufficient for street trees » Sufficient space for street furniture	» Not in transit interface zones or where downtown bus platforms needed » Main Streets, Ceremonial Streets, Business Streets, Downtown Neighbourhood Streets
	4	3.0 m to 3.3 m	1.3 m to 1.5 m	» Pedestrian 3 and 4 zones » Up to 1,000 pedestrians per hour	» Can accommodate street trees although constrained » Can accommodate limited street furniture	» Not in transit interface zones or where major downtown bus stops are planned » Business Streets, Downtown Neighbourhood Streets
✖	5	Less than 3 m	Less than 1.3 m	» Will fail to provide adequate capacity	» Cannot accommodate street trees » Cannot accommodate street furniture	» Existing conditions along many street segments » Appropriate only under special circumstances, such as when additional lands have been acquired through widening or easements for clear sidewalk width of 3m or greater

Figure 3-23: Municipal Sidewalk Classes for Downtown Ottawa

6. Street Trees: Street trees may be planted within the 1.1m utility zone along the curb edge, and may be planted on adjacent easements or private land. Where wider sidewalks can be provided, greater widths should be provided for the planting zone.

7. Cycling: Every street in downtown Ottawa enables cycling. There is a great diversity of on-street cycling solutions. Solutions will correspond to the planned function of the corridor.

8. Transit: Some streets will provide sidewalk widths that will accommodate a downtown bus platform (6.0m min. if enclosed shelter, 3.5m min. if canopy). Street corner radii to have regard for bus turning movements.

9. Travel Direction: Streets may be two-way or one-way. Contra-flow bike lanes may be considered.

10. Vehicle Lane Capacity: If streets are two-way, typically three lanes are required at intersections, one of which will allow for turning movements (usually left turns). If streets are one-way, a minimum of two lanes are required at intersections, both of which will allow for turning movements.

11. Vehicle Lane Widths: Vehicle lanes (with no cycling facilities) shall be 3.25m, plus 0.25 when adjacent to curb. Lanes that carry high amounts of bus or heavy vehicle traffic may require additional width.

12. On-Street Parking/Loading: Downtown streets will provide for on-street parking and loading on at least one side. Parking and loading bays are to be 2.25 to 2.5m width. On-street parking is encouraged to be located in bays with non-asphalt surface, which may function as shared sidewalk space when not occupied.

Based on the design direction described above, and having regard for these assumptions, a series of eleven (11) basic street design types are appropriate for downtown Ottawa. These street design types are intended to respond to the majority of streets in the study area. They can also be adapted to situations where the available right-of-way is larger than the 18.3m width for which they have been calibrated. The comparative performance characteristics of these street design types are presented on Figures 3-24 and 3-25.

Illustrations of the application of these complete street cross-sections in actual city blocks in downtown Ottawa are provided in the next section.

Type	Pedestrians		Cyclists	Transit Customers	Vehicle Users			
	Sidewalk Class at Corner, Per Side	Sidewalk Class at Mid-Block, Per Side	Cycling	Transit	Direction of Travel	Vehicles	On-Street Parking	Applicability By Street Type
A	3/3	4/4	Narrow Shared Lanes	-	Two-way	2 lanes total	2 sides	Business, Downtown Neighbourhood
B	3/3	3/2	Narrow Shared Lanes or Dedicated Lanes	Provides choice for platforms with shelters	Two-way	2 lanes total	1 side	Business, Ceremonial, Main, Showcase
C	4/4	4/3	Wide Shared Lanes	Provides choice for platforms with shelters	Two-way	2 lanes total	1 side	Business, Downtown Neighbourhood, Main
D	4/1	4/2	Dedicated Lanes or Separated Lane	Provides choice for platforms with shelters	One-way	2 or 3 lanes total	1 side, either in bay or as off-peak parking	Business, Downtown Neighbourhood
E	4/1	4/4	Bi-Directional, As Two-way Street	-	Two-way	2 lanes total	1 side	Business, Downtown Neighbourhood
F	4/1	4/4	Bi-Directional, Alternating	-	Alternating	2 lanes total	1 side	Business, Downtown Neighbourhood

Note: The classes, as indicated under "Sidewalk Class at corner" and at "Sidewalk Class at Mid-Block", refer to the class (column 1) on Table 3-23, page 107.

Figure 3-24: Street Design Typology For Downtown Ottawa

Type	Pedestrians	Cyclists	Transit Customers	Vehicle Users
A	Sufficient for moderate volumes. Opportunities for flexible use of curb spaces.	Narrow shared lane with cyclists in line with vehicles.	Space for shelters on both sides.	Opportunities for parking and laybys on both sides.
B	Sufficient for moderate to high volumes.	Narrow shared lane with cyclists in-line with vehicles, or dedicated facility.	Space for shelters on both sides.	Opportunities for parking and laybys on one side.
C	Sufficient for lower to moderate volumes.	Wide shared lane with opportunity for cyclist to travel besides vehicles.	Space for shelters on one side.	Opportunities for parking and laybys on one side.
D	Sufficient for high volumes at one corner and sufficient for moderate volumes in mid-block.	Dedicated or separated lanes.	Space for shelters on one side.	Opportunities for parking and laybys on one side (except for Type D5).
E	Sufficient for high volumes at one corner and sufficient for moderate volumes in mid-block.	Separated bi-directional lanes.	Space for shelter on one side.	Opportunities for parking and laybys on one side.
F	Sufficient for high volumes at one corner and sufficient for moderate volumes in mid-block.	Separated bi-directional lanes.	Space for shelter on one side.	Opportunities for parking and laybys on one side.

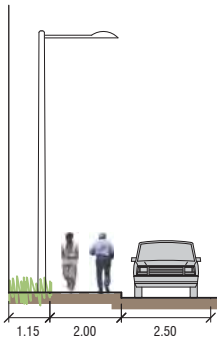
Note: The types, as indicated under the first column, correspond to the complete street design types as described in Figure 3-24 above.

Figure 3-25: Implications of Cross-Section on Types of Users

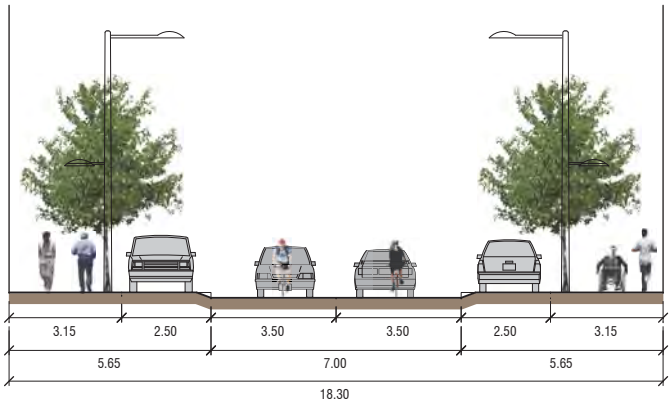
Type A

Two-Way
Narrow Shared Lanes (2)
Parking Both Sides

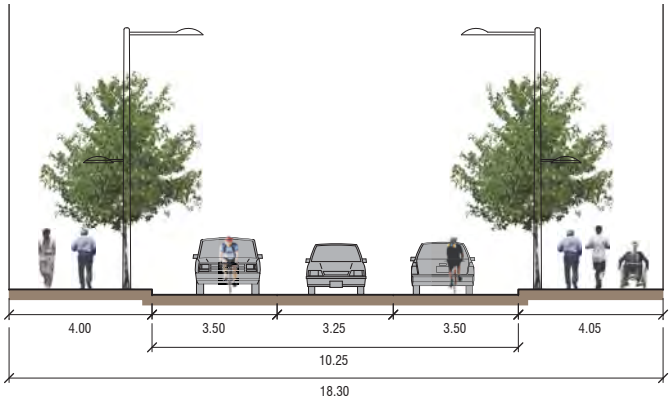
Optional Solution for Downtown Neighbourhood Applications

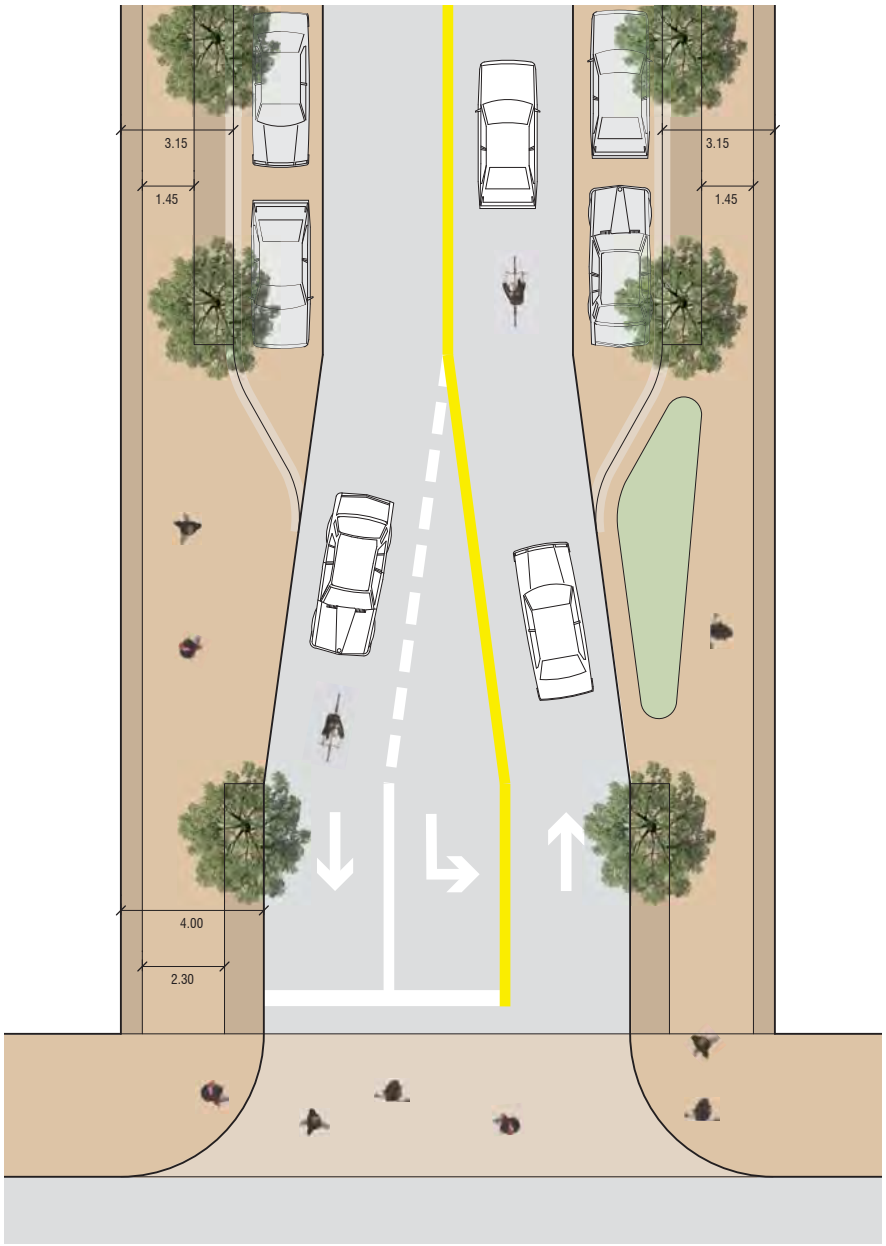


Mid-Block



At Corner

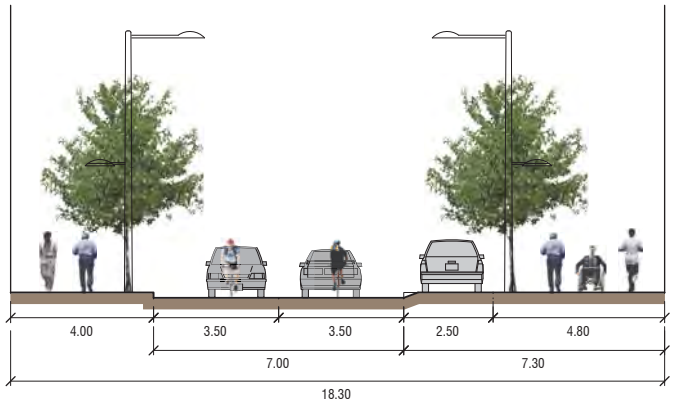


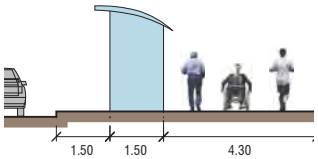


Type B1

Two-Way
Narrow Shared Lanes (2)
Parking One Side

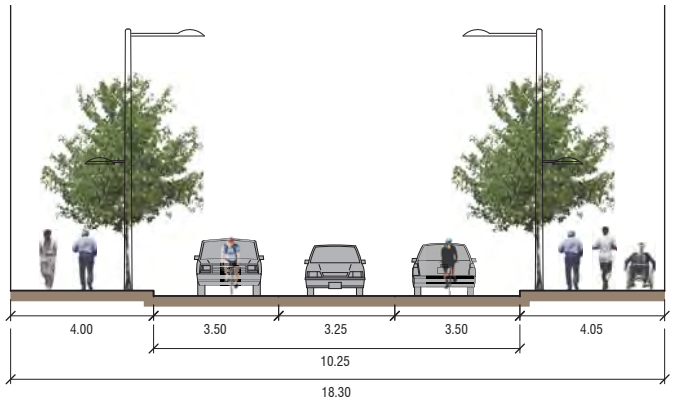
Mid-Block

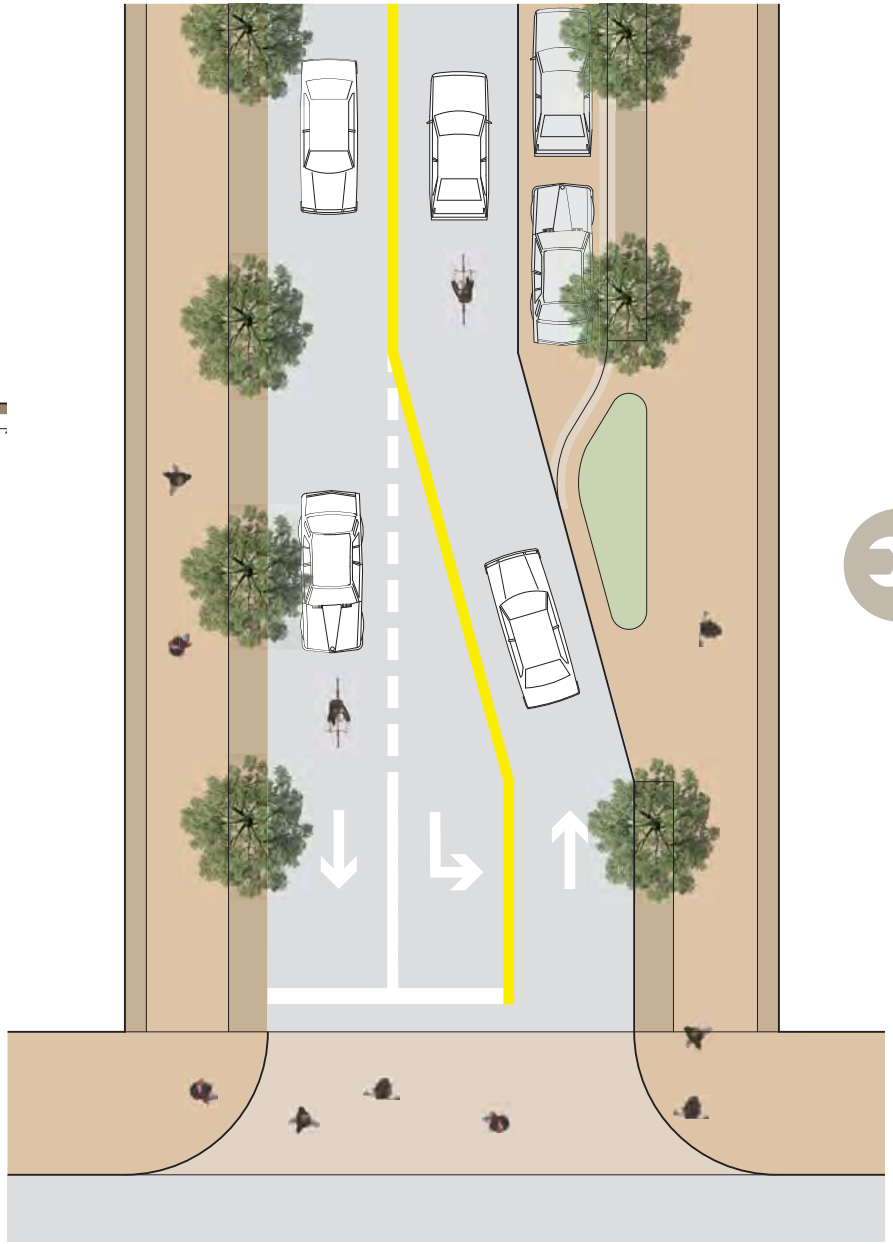




Optional Solution for Downtown Bus Platforms

At Corner

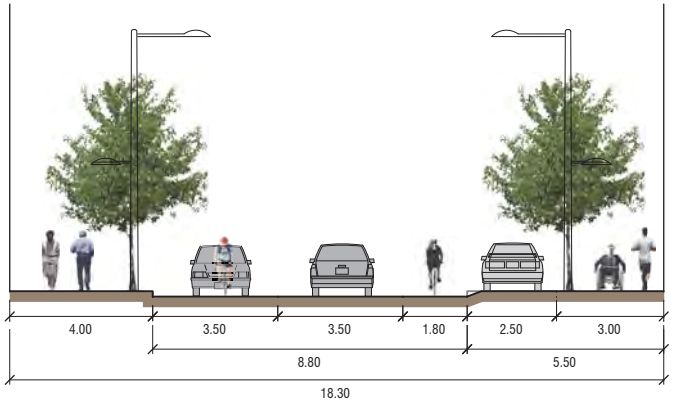




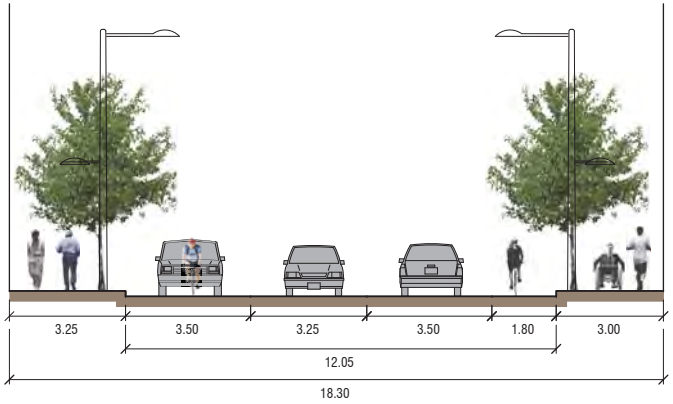
Type B2

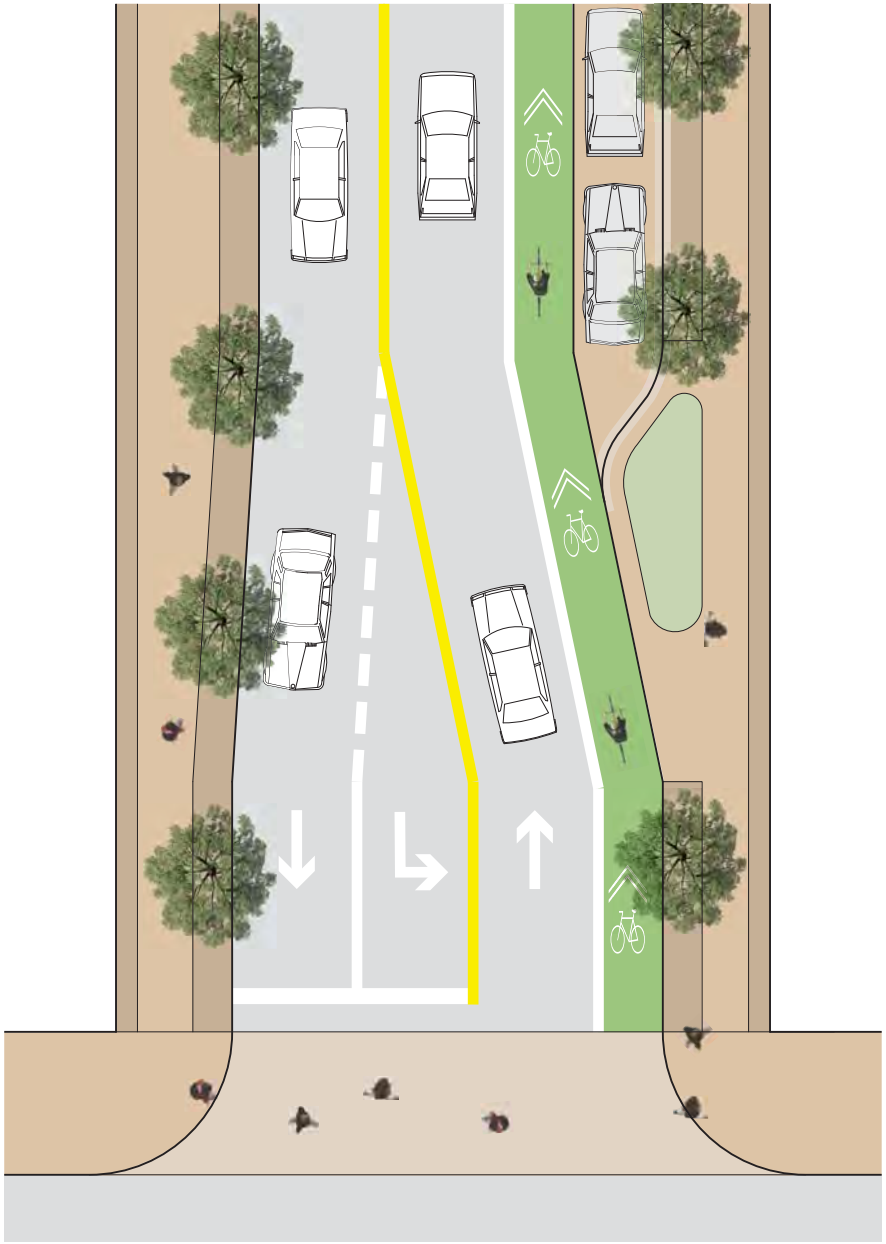
Two-Way
Narrow Shared Lanes (2), One-direction Cycling Lane
Parking One Side

Mid-Block



At Corner



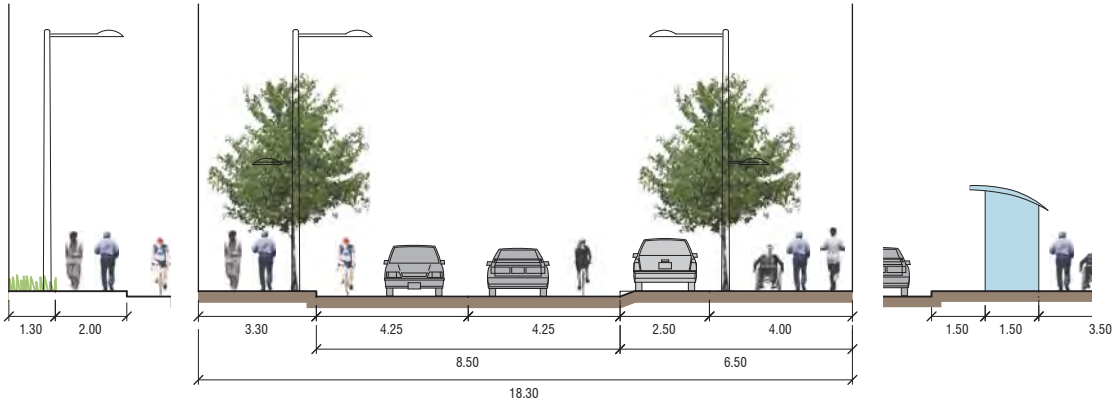


Type C

Two-Way
Wide Shared Lanes (2)
Parking One Side

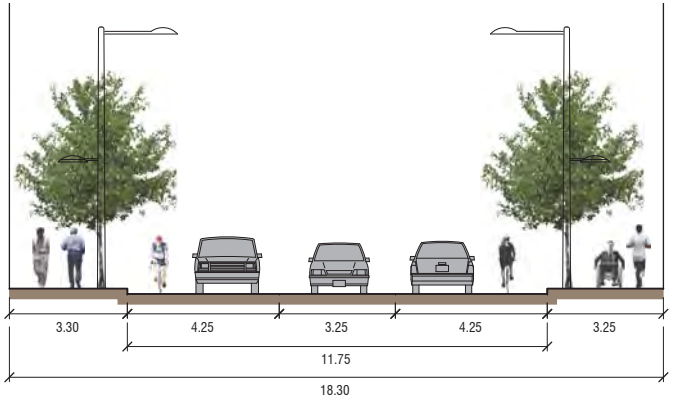
Optional Solution for Downtown Neighbourhood Applications

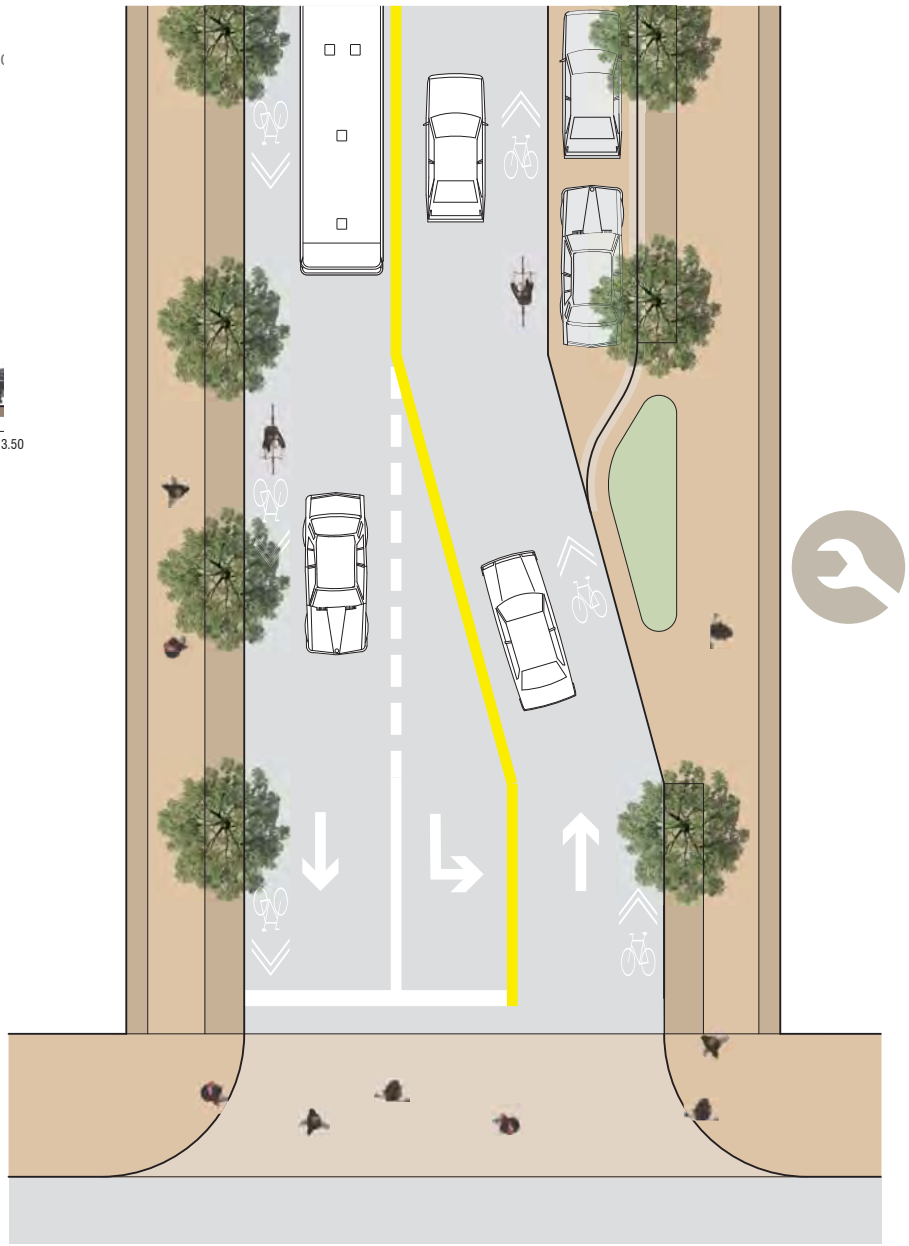
Mid-Block



Optional Solution for D(Bus Platforms

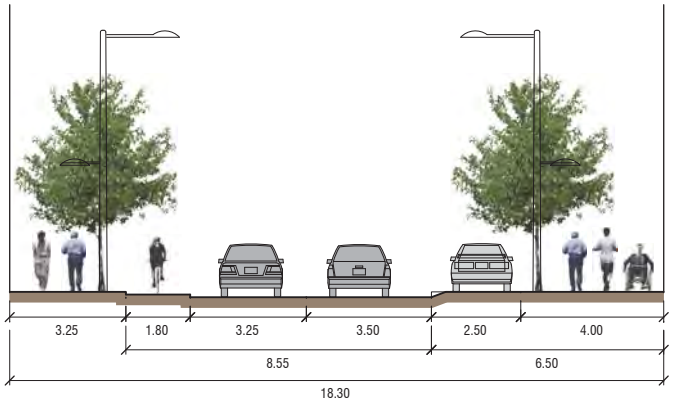
At Corner



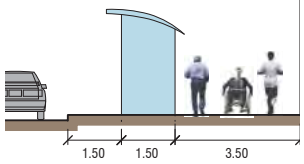


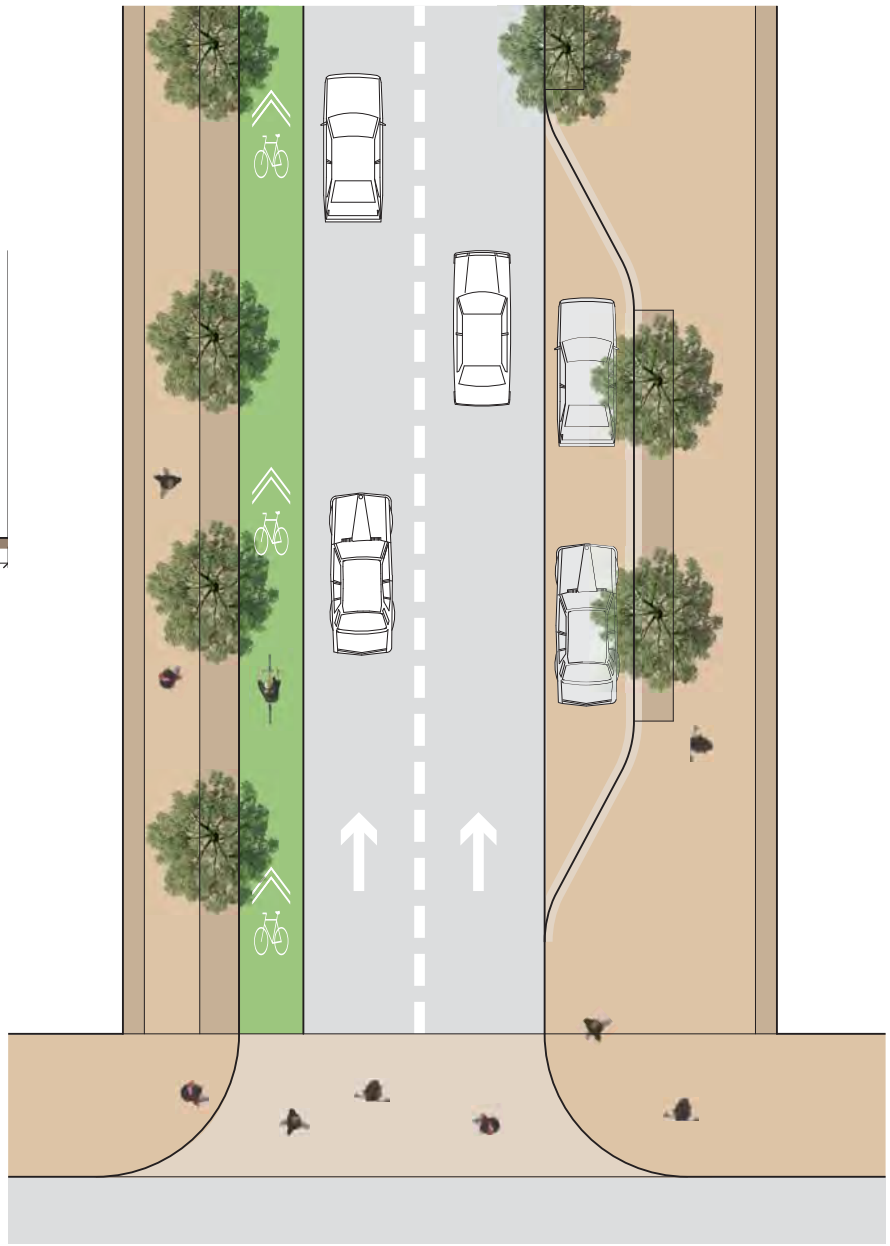
Type D1

One-Way
Two Vehicle Lanes, One Cycling Lane
Parking One Side



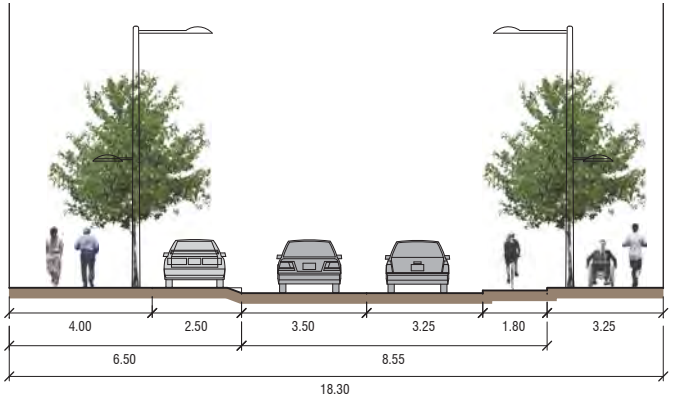
Optional Solution for Downtown
Bus Platforms

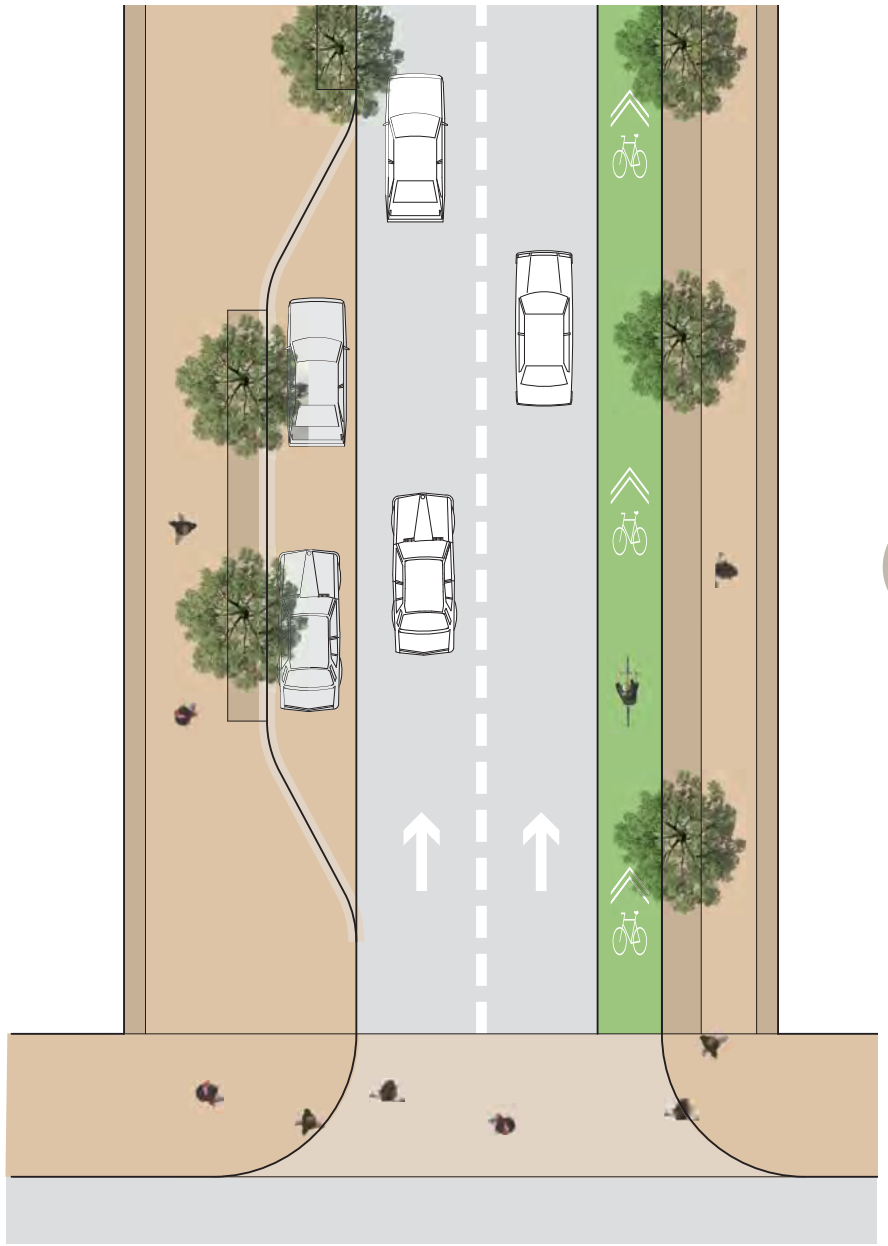




Type D2

One-Way
Two Vehicle Lanes, One Cycling Lane
Parking One Side

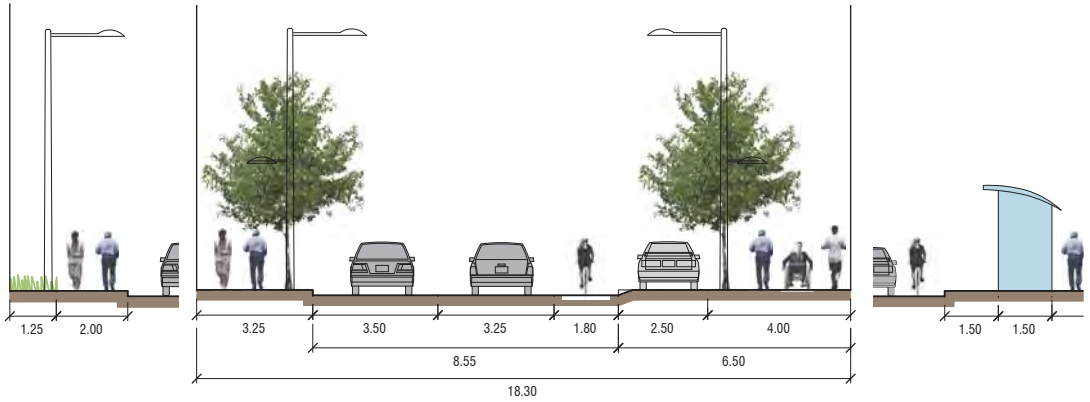




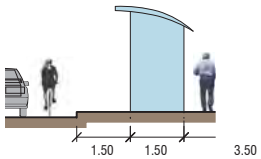
Type D3

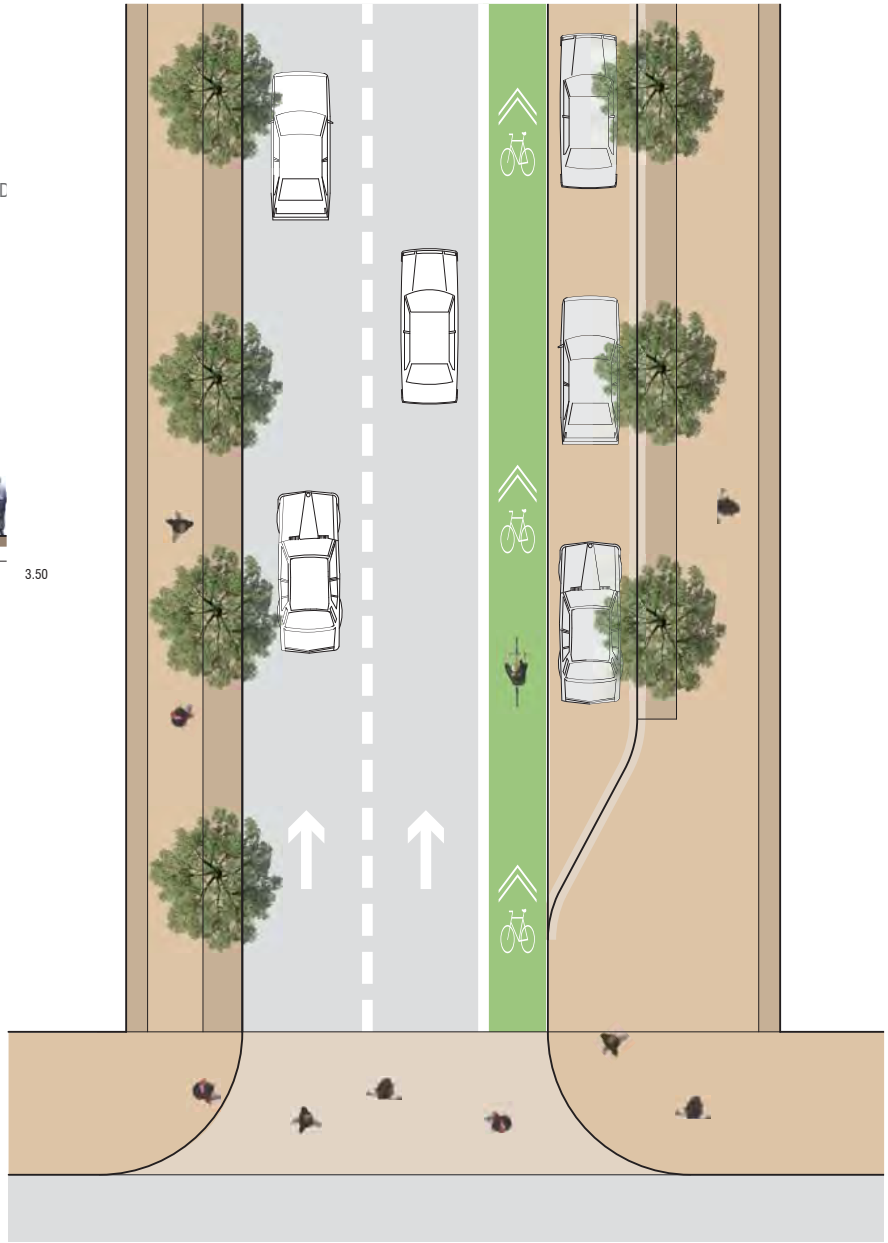
One-Way
Two Vehicle Lanes, One Cycling Lane
Parking One Side

Optional Solution for Downtown Neighbourhood Applications



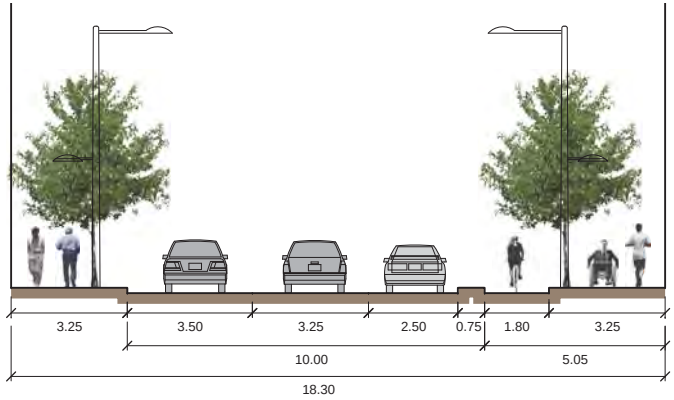
Optional Solution for D Bus Platforms

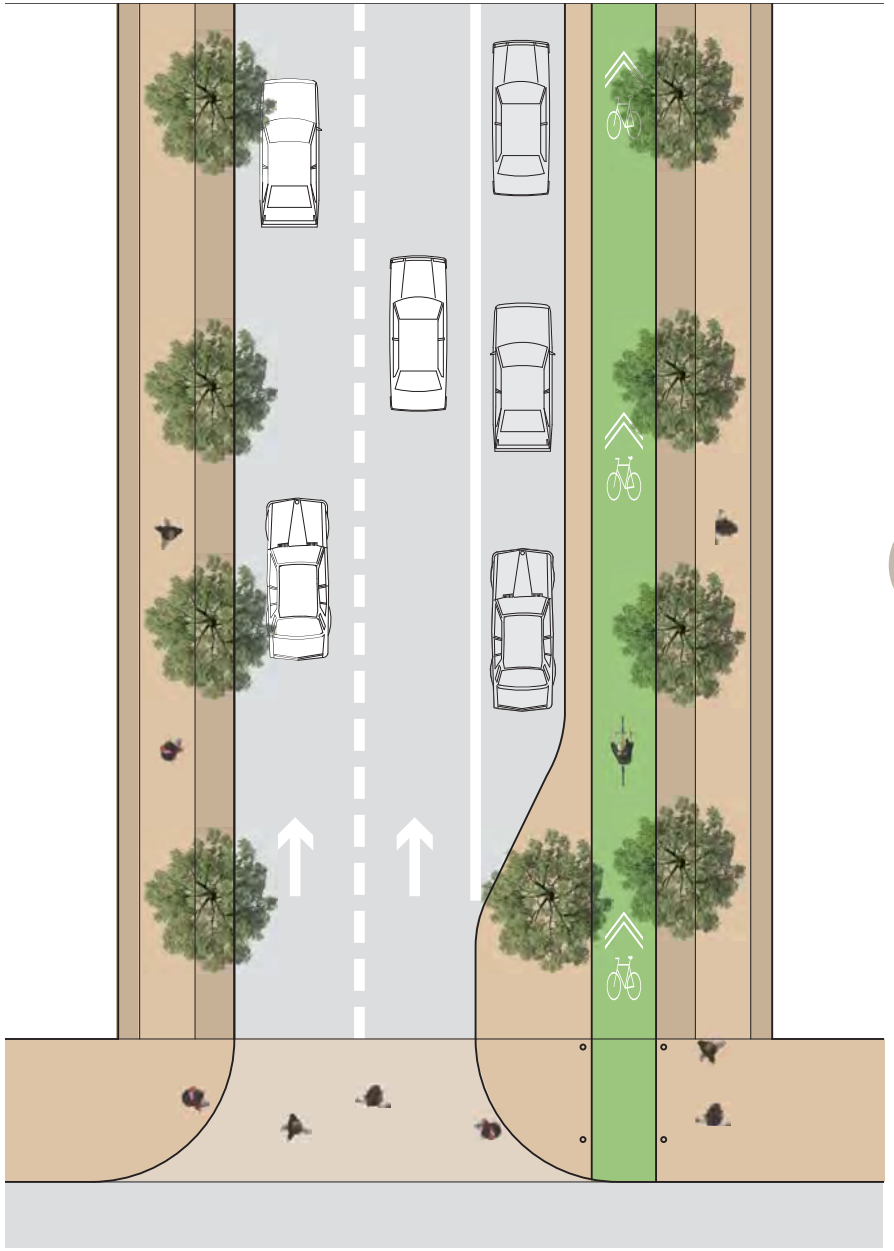




Type D4

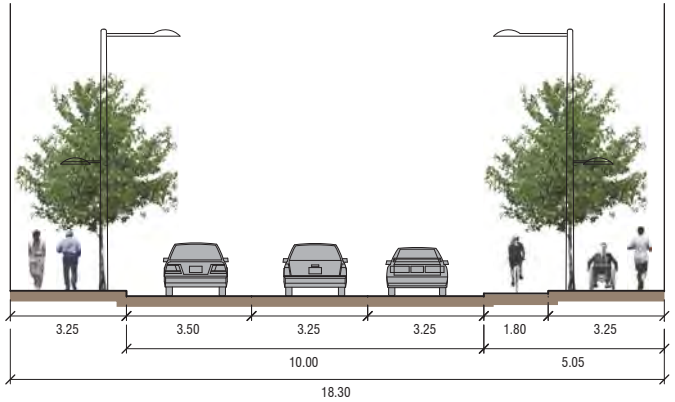
One-Way
Two Vehicle Lanes, One Cycling Lane
Parking One Side

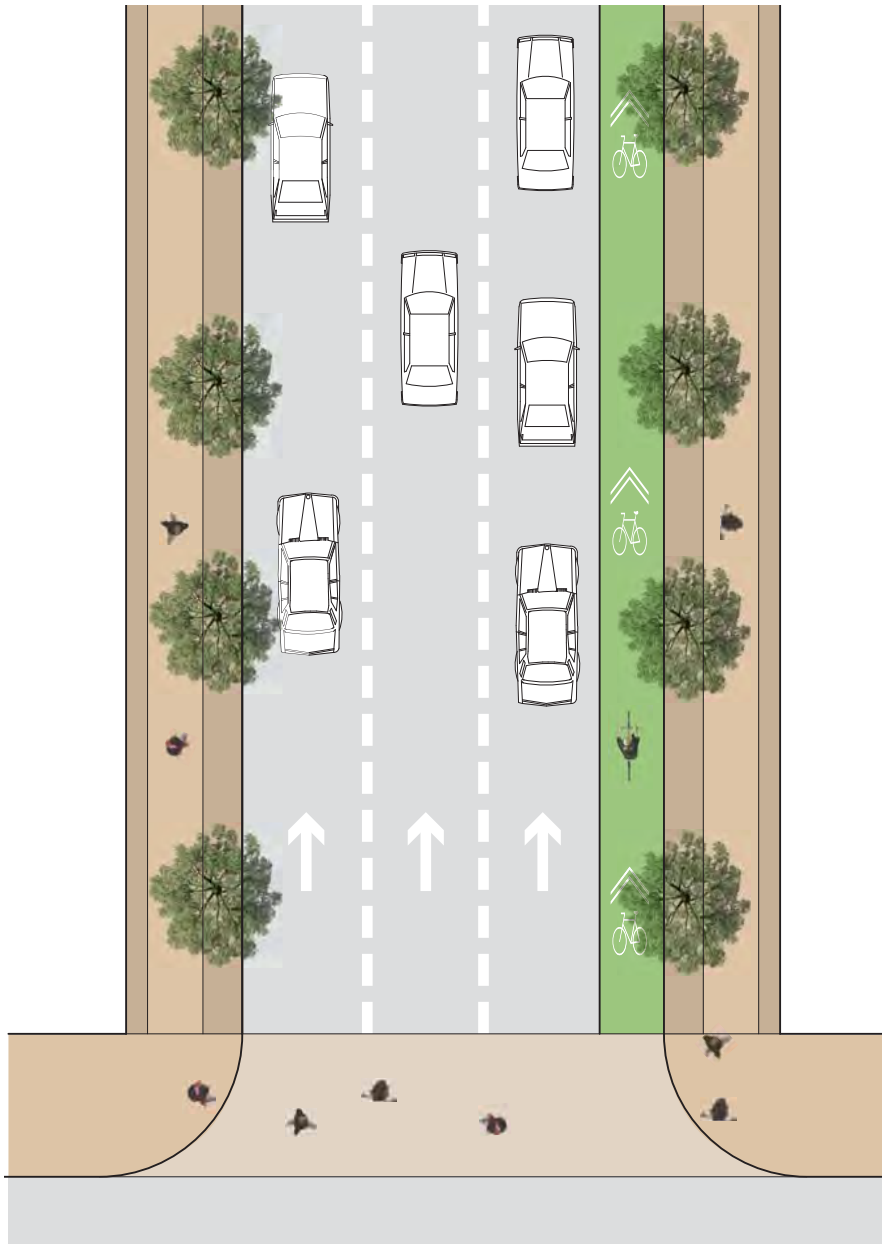




Type D5

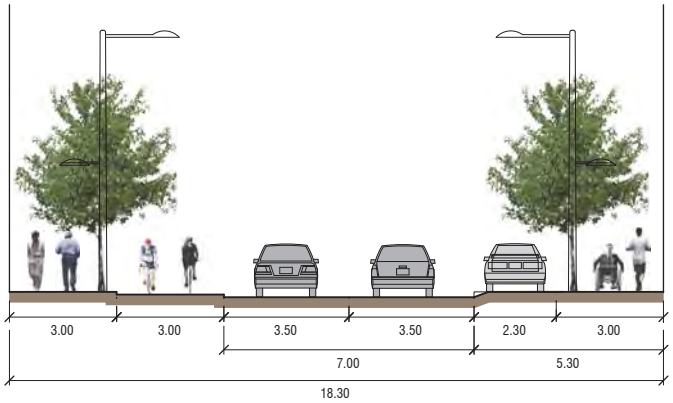
One-Way
Three Vehicle Lanes, One Cycling Lane
Off-Peak Period Parking One Side



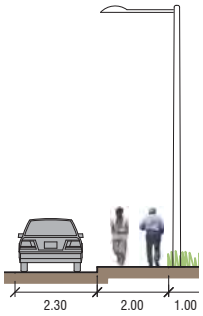


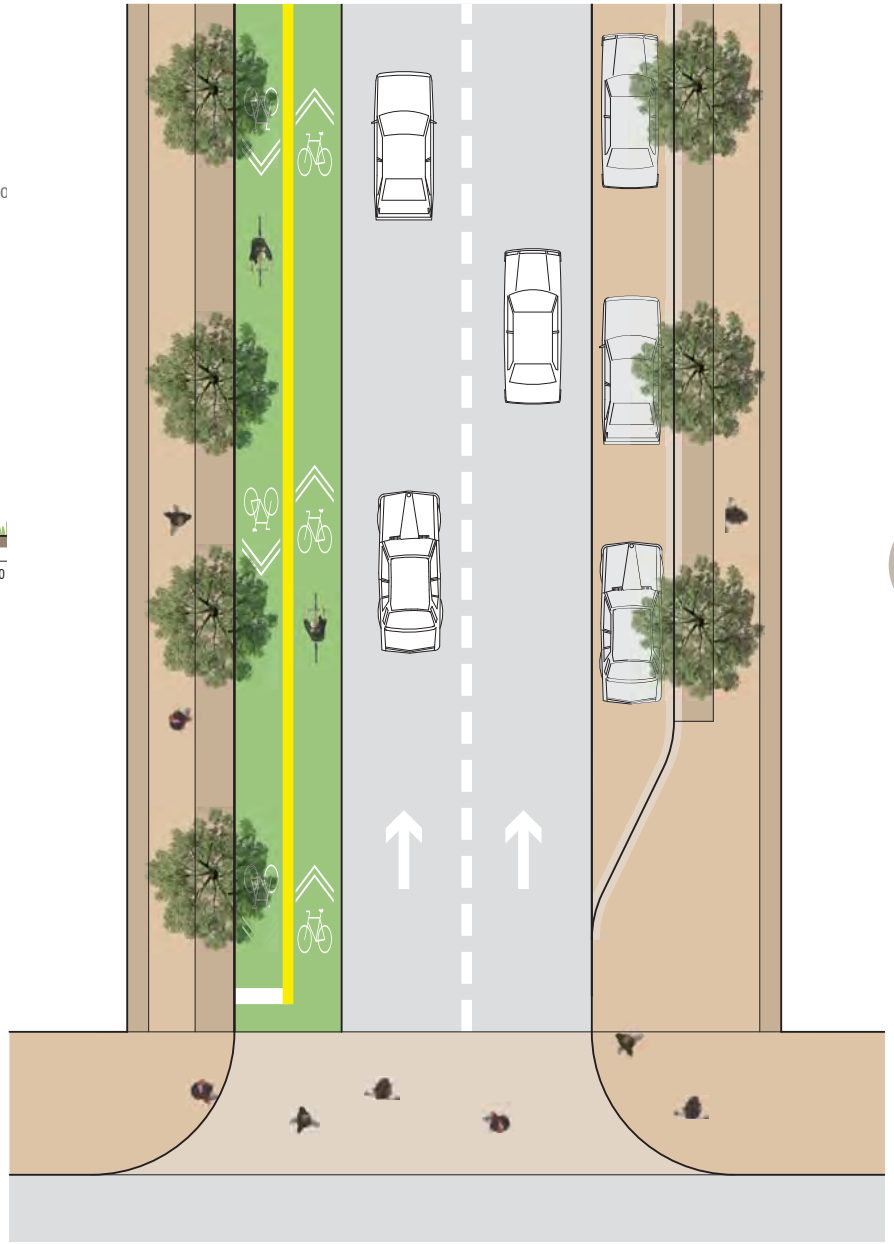
Type E

Two-Way
Two Vehicle Lanes, Bi-Directional Cycling Lane
Parking One Side



Optional Solution for
Downtown Neighbourho
Applications

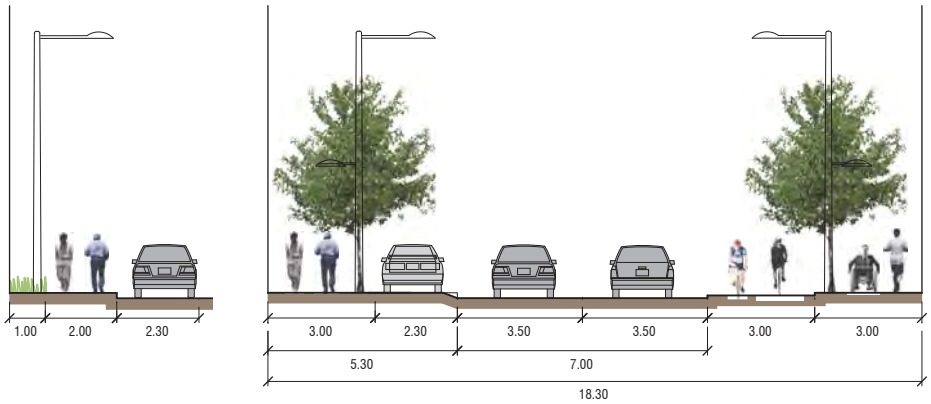


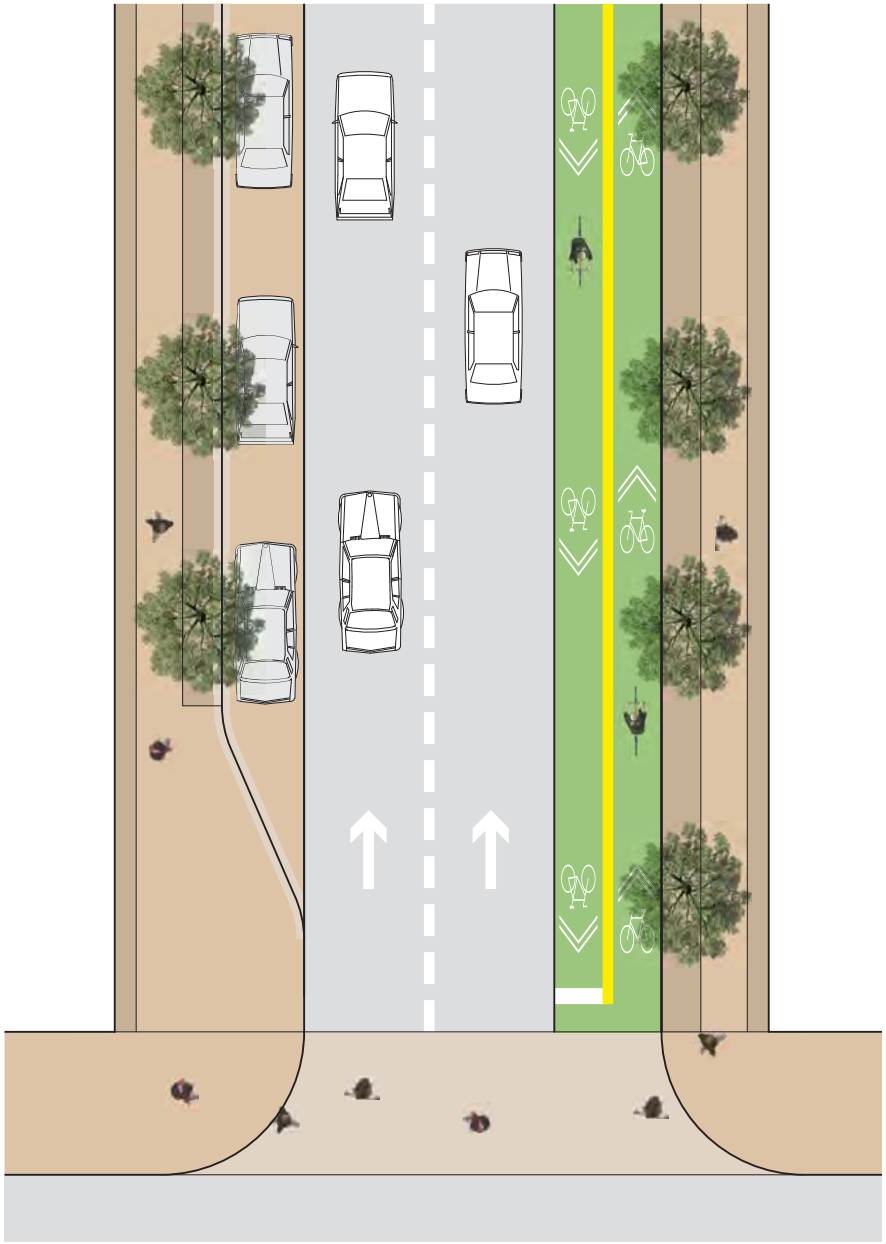


Type F

Alternating
Two Vehicle Lanes, Bi-Directional Cycling Lane
Parking One Side

Optional Solution for Downtown Neighbourhood Applications





4.1 Vital Moves
4.2 Street Demonstrations

4 Downtown Moves & Demonstrations

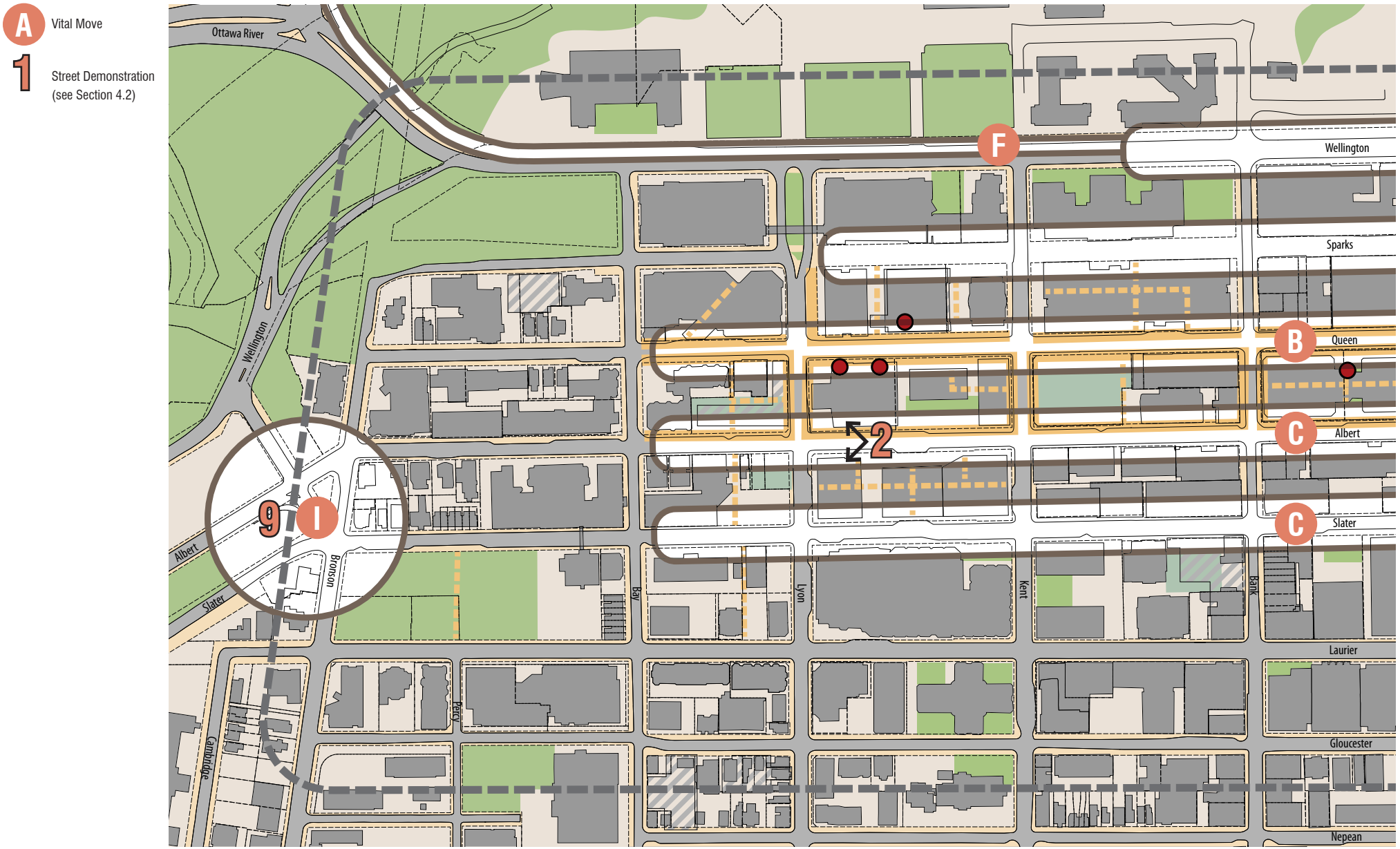
Building on the information and analysis presented in the previous sections, this section puts together all of the individual components required to improve and enhance the mobility of our downtown streets. Vital Moves are introduced and represent potential physical changes that will enable the Vision and Strategic Directions. The Street Demonstrations illustrate potential ways of integrating urban design and transportation planning elements, demonstrating the design of lands adjacent to the right-of-way and incorporating such provisions as pedestrian easements and/or building canopy overhangs.

4.1 Vital Moves

Through the stakeholder consultation undertaken for Downtown Moves and based on transportation and urban design analyses, a series of "Vital Moves" have been identified. These Vital Moves represent potential changes (i.e. physical projects) to downtown Ottawa streets in a manner that addresses the Vision and Strategic Directions established for Downtown Moves. A number of these Moves are visually displayed in corresponding Street Demonstrations in Section 4.2.

- **A** Secure Wider Sidewalks Near Transit Station Entrances
- **B** Transform Queen Street into a Transit Showcase Street
- **C** Revitalize Albert and Slater Streets

Figure 4-1: Vital Moves and Street Demonstrations for Downtown Ottawa



D Connect Downtown to Lowertown

E Renew Sparks Street

F Complete an Inter-Provincial Bike Loop

G Integrate Town and Crown Across Wellington Street

H Embellish Metcalfe Street

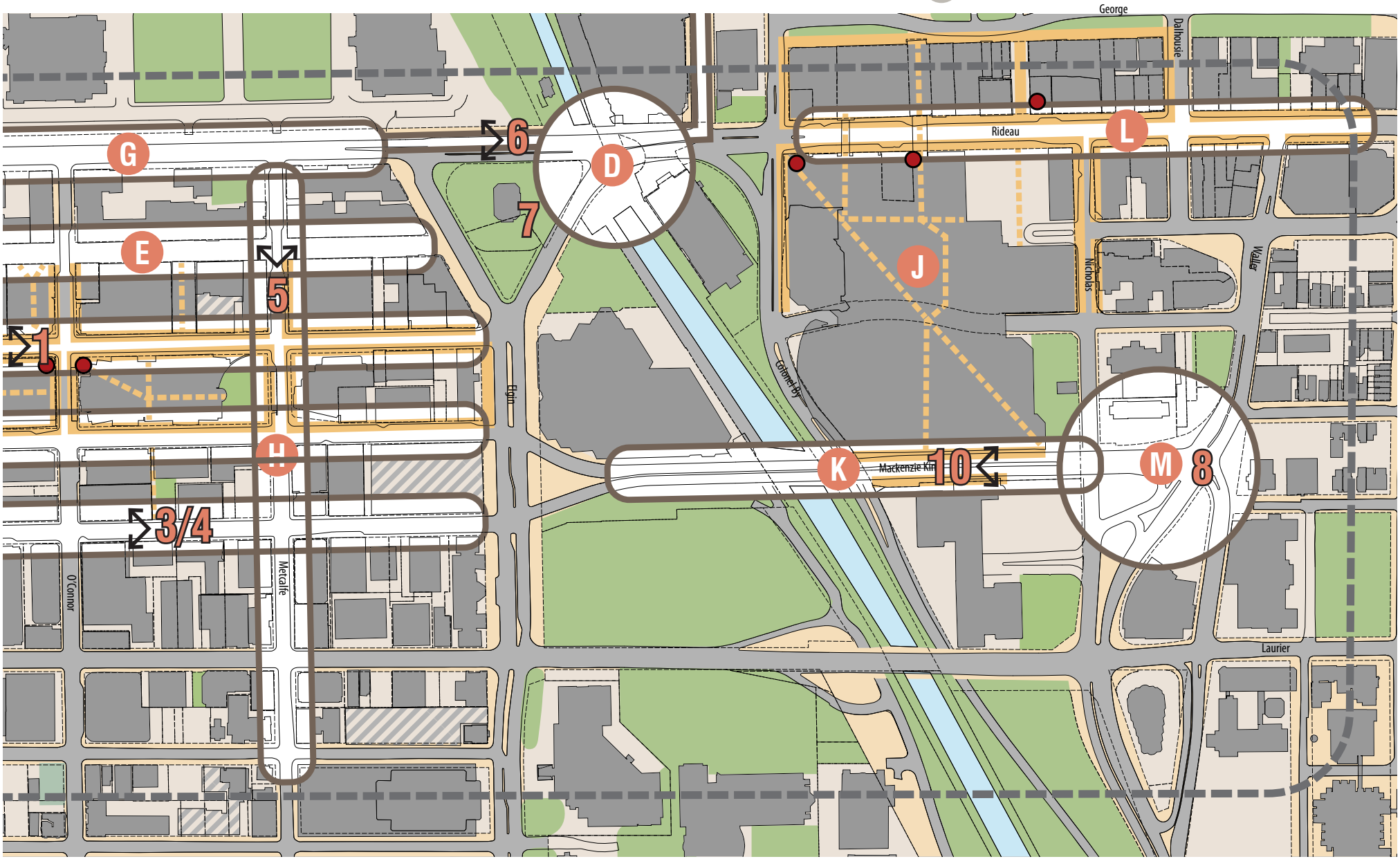
I Connect Downtown to Lebreton Flats

J Enable Mid-Block Connections Serving the Transit Stations

K Repurpose Mackenzie King Bridge

L Revitalize Rideau Street as a Main Street

M Improve the Mackenzie King/Nicholas/Waller Intersection



Move A Secure Wider Sidewalks Near Transit Station Entrances

Move B Transform Queen Street into a Transit Showcase Street

Move C Revitalize Albert and Slater Streets

Move D Connect Downtown to Lowertown

Move E Renew Sparks Street

Move F Complete an Inter-Provincial Bike Loop

Move G Integrate Town and Crown Across Wellington Street

Move H Embellish Metcalfe Street

Move I Connect Downtown to Lebreton Flats

Move J Enable Mid-Block Connections Serving the Transit Stations

Move K Repurpose Mackenzie King Bridge

Move L Revitalize Rideau Street as a Main Street

Move M Improve the Mackenzie King/Nicholas/Waller Intersection

Move A

Secure Wider Sidewalks Near Transit Station Entrances

The essence of this Move is to accommodate pedestrian traffic in the vicinity of Confederation Line station entrances by providing an abundance of capacity and an inviting walking environment. Design objectives include:

- Providing a high pedestrian 'level-of-service' for sidewalks near Confederation Line station entrances that corresponds to forecast pedestrian movements;
- Enhancing the pedestrian environment with street planting and co-ordinated street furniture; and,
- Providing on-street parking and loading space in a flexible manner that most efficiently uses the available ROW.

Move A is illustrated in Demonstration 1 in Section 4.2, which shows widened sidewalks on Queen Street providing generous clear travel zones for pedestrians in the vicinity of the Confederation Line station entrance. The demonstration also shows co-ordinated street planting and furnishings, and the use of flex spaces for loading and parking.

Vancouver, BC

Move B

Transform Queen Street into a Transit Showcase Street

The essence of this Move is to transform Queen Street into downtown Ottawa's Showcase Street, respond to the demands that will be placed on the street by the Confederation Line station entrances located along it. As a Showcase Street, Queen Street will comfortably support high pedestrian volumes within a vastly improved street environment that greatly prioritizes the enjoyment and ease of movement of pedestrians. Design objectives include:

- Providing wide sidewalks with distinctive paving materials to support a high pedestrian 'level-of-service', and to establish an attractive and comfortable environment for pedestrians;
- Facilitating seamless transfers between the Confederation Line and bus service systems by locating bus stops on all four sides of the same block perimeter as Confederation Line station entrances where possible;
- Designing bus stops with generous curbside loading areas to provide high levels of comfort, safety, and weather protection for waiting transit customers;
- Beautifying the streetscape with a co-ordinated family of street plantings and furnishings to promote walking and leisure activities on-street;
- Incentivizing the development of active street-oriented uses such as retail stores and restaurant patios through the economic opportunity brought about by substantial improvements in sidewalk and streetscape condition;
- Developing an integrated wayfinding and signage system that assists with movement between Confederation Line stations and significant civic, cultural, and retail destinations;
- Providing ample bicycle parking;
- Providing on-street parking and loading space in a flexible manner that most efficiently uses the available ROW; and,
- Including street trees and state of the art approaches to sustainable planting and drainage.

Move B is depicted in Demonstration 1. The demonstration shows a sidewalk area providing generous pedestrian clear zones, a co-ordinated family of street furnishings, dense street tree coverage, and flex spaces for loading and parking. Flex spaces provide the opportunity for the sidewalk area to be further expanded by eliminating on-street parking through the placement of bollards. Awnings and outdoor restaurant seating help to animate the street environment.

Source: image included in following report: "Construction and Maintenance of the Ottawa Light Rail Transit System", Appendix 1, pg 17.

Move C

Revitalize Albert and Slater Streets

The essence of this Move is to revive Albert and Slater Streets as "complete streets" upon the commencement of the Confederation Line service, in contrast to their existing functions mainly as utilitarian corridors for bus and vehicle movement. Design objectives include:

- Increasing pedestrian and cycling capacity and function by converting the bus-only lanes when they are no longer required;
- Beautifying the streetscape by providing for tree planting on both sides of the streets, and applying sidewalk paving materials that add character;
- Establishing separated bicycle facilities to support the development of an east-west bikeway, that would either compliment or replace the Laurier Avenue bike lanes (depending on the result of the pilot project);
- Designing high-quality bus stop zones with bus platforms in locations where the streets continue to provide for bus transit service, to facilitate safe, convenient and high capacity passenger loading/unloading; and
- Accommodating vehicle loading and parking zones in "flex spaces" otherwise provide the opportunity for expanded pedestrian space.

Move C is depicted in Demonstrations 2 and 4, which show separated or shared bicycle facilities, wider sidewalks, upgraded streetscaping, and flex spaces for parking and loading along Albert and Slater Streets as one-way streets. Demonstrations 2 and 3 correspond with Complete Street Type D1, as introduced in Section 3.6

Should both streets be converted to two-way streets and reconstructed, they could be designed in accordance with Demonstration 4. This corresponds to Complete Street Type B1. One-directional bike lanes could be added to that demonstration, with lesser space allocated to the sidewalk zone, which corresponds to Complete Street Type B2.

Move D

Connect Downtown to Lowertown

The essence of this Move is to better connect Downtown Ottawa with Lowertown, the Byward Market, and the emerging arts and entertainment district, which includes Rideau Street, the Rideau Centre, and Arts Court. Design objectives include:

- Facilitating safer crossings for pedestrians across Elgin Street at Queen Street, by reducing vehicle lanes and shortening crosswalk distances, so limiting channelized right turn lanes;
- Creating a new "T-intersection" at the intersection of Wellington Street and the east leg of Elgin Street, with standard crosswalks and a reduction in the number of right turn lanes;
- Creating new public space around the War Memorial Triangle by reducing vehicle lanes and converting them to useable sidewalk space on the Elgin Street sidewalk side;
- Establishing pedestrian priority through such means as paving materials at crosswalks that contrasts with the roadway, raising crosswalks and intersections, establishing pedestrian signal priority, and, providing scramble intersections if pedestrian volume warrants them;
- Continuing to provide for on-street loading/parking areas along the west side of Elgin Street, north of Queen Street; and
- Providing separated bike lanes along Elgin Street in each direction, linking to cycling facilities on Wellington Street, Sussex Drive, and MacKenzie Avenue.

Move D is depicted in Demonstration 7, at the War Memorial Triangle.

Elgin St at Wellington St, Ottawa, ON

Move E

Renew Sparks Street

The essence of this Move is to change the functionality of the Sparks Street ROW to support efforts by the NCC and the Sparks Street BIA to revitalize and enliven the street as a mixed use commercial plaza space. Design objectives include:

- Accommodating cycling on Sparks Street as a space shared with pedestrians;
- Promoting additional street-oriented uses and facades to animate the street;
- Providing additional on-street food vending, retail and entertainment opportunities;
- Allowing limited vehicle access at specific times and seasons to facilitate access;
- Co-ordinating a street design theme with street furniture; and,
- Extending the design features, quality and character to Queen Street and the North-South streets that connect them so that the area is perceived as a district, integrated with the Confederation Line.

The functional design exercise that has been initiated by Spark Street BIA should consider ways to safely introduce cycling to the street, thereby bringing more visitors and patrons to support the retailing and place-making objectives.

Sparks St, Ottawa, ON

Move F

Complete an Inter-Provincial Bike Loop

The essence of this Move is to integrate existing bicycle facilities that cross the Ottawa River to promote inter-provincial bike travel for commuters, residents, and visitors to the Capital, as a relatively uninterrupted "loop". Design objectives include:

- Providing a high quality cycling facility on Wellington Street in both directions, linking Mackenzie Avenue to the Portage Bridge;
- Providing a high quality cycling facility on Mackenzie Avenue in both directions, linking the Alexandra Bridge to Wellington Street; and,
- Integrating the bike loop into the downtown cycling network.

Move F is depicted in Demonstration 6, which shows a potential solution through the addition of a bi-directional bicycle facility on the north side of Wellington Street. This could be coupled with a bi-directional cycling facility along the west side of Mackenzie Avenue. Together, these interventions would enable cyclists to travel in a continuous loop between the two inter-provincial bridges without having to enter onto a municipal roadway. The Wellington Street Move may entail the elimination of the left-turn lanes on the street in order to capture adequate ROW width. If a bi-directional facility is not favoured, separated cycling lanes along each side of the street could be pursued.

Portage Bridge, Ottawa, ON

Move G

Integrate Town and Crown Across Wellington Street

The essence of this Move is to enhance crosswalks and cycling connectivity, and to thematically link Downtown Ottawa to Confederation Boulevard and the Parliamentary Precinct. Design objectives include:

- Providing wider sidewalks and high quality streetscaping on streets that link Parliament Hill with downtown, on the blocks between Wellington and Queen Streets.
- Co-ordinating street furnishings, sidewalk/curb materials, street lighting, and tree planting on both sides of Wellington Street; and,
- Linking downtown cycling routes and facilities with those on Confederation Boulevard.

Lyon St, Ottawa, ON

Move H

Embellish Metcalfe Street

The essence of this Move is to invest in the embellishment of Metcalfe Street, recognizing its unique character as an artery running through Downtown Ottawa that connects Parliament Hill and the Museum of Nature. Design objectives include:

- Widening sidewalks to provide greater comfort and mobility for pedestrians;
- Establishing priority pedestrian crossing through the use of raised intersections and/or scramble intersections in the vicinity of Confederation Line stations;
- Extending the "tree-lined" quality of the street found in Centretown through the downtown; and,
- Providing a separated bicycle facility along the entire length of the street, in one direction or both (depending on the planned function of O'Connor Street in regards to cycling).

Move H is depicted in Demonstration 5, which shows wider sidewalks, street planting, and a separated bicycle facility on Metcalfe Street. This illustration corresponds with Complete Street Type D1.

Metcalfe St, Ottawa, ON (source: © 2012 Google)

Move I

Connect Downtown to Lebreton Flats

The essence of this Move is to establish a stronger connection between downtown and the Lebreton Flats area for all mode users. Design objectives include:

- Enhancing continuity for cyclists travelling to and from downtown by providing bicycle facilities on Albert and Slater Streets that extend west of Bronson Avenue;
- Enabling the connectivity of the Laurier Avenue bike lanes pilot project across Bronson Street, should the lanes be made permanent;
- Establishing a shift in street character with traffic calming measures on Albert and Slater Streets immediately east of Bronson Avenue;
- Assisting with wayfinding by establishing landmarks or gateways at the convergence of Albert, Slater and Bronson Streets; and,
- Providing signage to clearly indicate to all road users a change of road character where downtown Ottawa and Lebreton Flats converge.

Move I is depicted in Demonstration 9, which shows proposed cycling facilities connecting Albert and Slater streets to Lebreton Flats. It also introduces a new multi-use pathway connecting the existing Laurier Avenue bicycle lanes to Slater Street. This design works in harmony with the Demonstration for Albert and Slater streets, illustrating separated cycling lanes on the left-side of the streets.

Bronson and Slater Intersection, Ottawa, ON (source: © 2012 Google)

Move J

Enable Mid-Block Connections Serving the Transit Stations

The essence of this Move is to prioritize the ease of pedestrian movement to and from Confederation Line stations by augmenting municipal sidewalks with routes on private property. Design objectives include:

- Enhancing pedestrian mobility by providing off-street route choices through new buildings, preferably at street level;
- Focusing on locations in blocks immediately adjacent to transit stations, on either side of the street;
- Developing an integrated wayfinding and signage system to promote a co-ordinated network of through-block connections;
- Emphasizing the establishment of mid-block connections in the vicinity of the Downtown West Station; and,
- Providing additional mid-block connections through site redevelopment in the vicinity of Rideau Station.

Constitution Square, Ottawa, ON (source: © 2012 Google)

Move K

Repurpose Mackenzie King Bridge

The essence of this Move is to repurpose Mackenzie King Bridge as a more balanced street for all users after the commencement of Confederation Line service, with reduced emphasis on its function as a transit corridor. A repurposed Mackenzie King Bridge can function as an important civic promenade providing scenic vantage points and linking important civic and cultural institutions. Design objectives include:

- Enhancing and widening the existing bi-directional bicycle facility in support of an east-west bikeway and eliminating the central dividing barrier;
- Improving the pedestrian environment along the street edge by incorporating street planting that soften climatic conditions and high-quality sidewalks;
- Explore the opportunity for an open-air civic promenade between the National Arts Centre and the Ottawa Convention Centre/Rideau Centre;
- Allocating sufficient on-road space dedicated to transit vehicles, but prioritizing the needs of pedestrians and cyclists; and,
- Incentivizing the development of active street frontages through the development approval process in conjunction with the redevelopment of uses on the bridge.

Move K is depicted in Demonstrations 10 and 11, which show a revitalized Mackenzie King Bridge with an enhanced bidirectional bicycle facility, improved streetscaping and street planting, and lane allocations that reflect reduced levels of bus traffic. This design would work in harmony with the Demonstrations provided for Albert and Slater streets which promote the introduction of a separate cycling lane along the left hand side of the street in a one-way orientation.

Mackenzie King Bridge, Ottawa, ON

Move L

Revitalize Rideau Street as a Main Street

The essence of this Move is to reinforce the planned function of Rideau Street as a "Traditional Mainstreet" and a "Theme Street" within Ottawa's retail, arts & theatre district through streetscape improvements to prioritize pedestrian comfort and movement. Design objectives include:

- Implementing priority pedestrian crossings as identified in Pedestrian Vision Plan 1 (Pedestrian Infrastructure) through the use of widened crosswalks, contrasting concrete crosswalks, or traffic signal changes;
- Securing wide sidewalks in the vicinity of Confederation Line station entrances;
- Providing for through-block connections in the vicinity of the transit stations;
- Encouraging street-oriented uses that animate the pedestrian environment;
- Minimizing the amount of sidewalk space displaced by bus and taxi lay-bys, and evaluate the possibility of on-street parking during evenings and weekends; and,
- Improving streetscaping and planting to increase the comfort of the pedestrian environment.

These objectives can be considered in the ongoing studies involving the renewal of Rideau Street and possible modifications to the intersection of Rideau Street and Sussex Drive, and for streetscape improvement plans on Rideau Street between Sussex Drive and Dalhousie Street.

Rideau St, Ottawa, ON

Move M

Improve the Mackenzie King/Nicholas/Waller Intersection

The essence of this Move is to simplify the Mackenzie/Nicholas/Waller intersection for all users, but particularly for pedestrians and cyclists to facilitate access to Rideau Station from Sandy Hill, the University of Ottawa, and Arts Court. It will also contribute to cross-town cycling connections. Design objectives include:

- Connecting the Mackenzie King Bridge and Stewart Street bicycle facilities with a bike path behind the sidewalk along the east side of the Mackenzie King/Waller intersection and providing a connection to the planned East-West bikeway;
- Improving distinction between the bicycle signal phases and traffic signal phases;
- Re-aligning the crosswalk at the Transitway and Waller Street intersection to provide for more direct pedestrian crossing to the Séraphin-Marion pedestrian plaza; and
- Emphasizing pedestrian crossings with contrasting paving and pedestrian priority signals.

Move M is depicted in Demonstration 8, which shows the widening of sidewalks to improve the pedestrian environment and to narrow intersection crossings. It also introduces a comprehensive bicycle strategy, enhancing the connection between the Sandy Hill community and the University of Ottawa to downtown via Mackenzie King Bridge and to Lowertown. This design works in harmony with the Demonstrations for Mackenzie King Bridge showing the bi-directional bicycle facility.

Mackenzie King/Nicholas/Waller Intersection, Ottawa, ON (source: © 2012 Google)

4.2 Street Demonstrations

The following Street Demonstrations correspond with the Plan of Streets, incorporate all elements of the functional overlay maps, as introduced in Section 2 and illustrate features derived from the Street Design Toolkit, Section 3. Each demonstration is designed to respond to actual street constraints and meet future desirable conditions, including the Confederation Line Station entrance and access points. The designs also show how the future configuration of streets in downtown Ottawa can be implemented in linear terms, addressing matters such as Confederation Line accesses, parking garage entrances, loading areas, crosswalk treatments for pedestrian priority areas and a rhythm of streetscaping features that create not only functional, but also attractive streets. Each demonstration illustrates only one of the many possible scenarios for each area. They depict progressive and innovative street designs that highlight a variety of features from the Street Design Toolkit. Several of these demonstrations also correspond to the identified Vital Moves as described in the previous section.

Demonstration 1

Queen St (west of O'Connor St)

Demonstration 2

Albert St (at Lyon St)

Demonstration 3

Slater St (west of Metcalfe St)

Demonstration 4

Slater St (west of Metcalfe St) as Two-Way

Demonstration 5

Metcalfe St (at Sparks St)

Demonstration 6

Wellington St (at Elgin St)

Demonstration 7

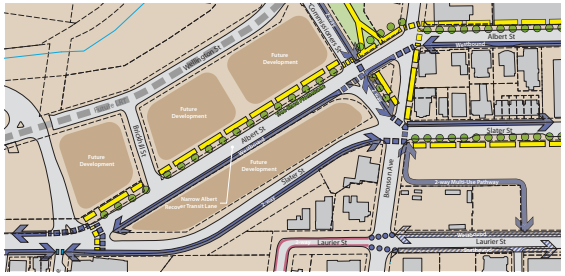
War Memorial Triangle

Demonstration 8

Mackenzie King/Nicholas/Waller Connection

Demonstration 9

Bronson/Albert/Slater Connection



Demonstration 10

Mackenzie King Bridge (looking east)

Demonstration 11

Mackenzie King Bridge (looking west)

Demonstration 1

Queen St (west of O'Connor St)

Pedestrian (P)

(Section 3.1)

P2.1 Sidewalk width that corresponds to anticipated pedestrian use.
Min 3.0 m wide

P2.3 Extend pedestrian zone paving to building edge.

P2.11 Mountable curbs create "flex space". Paving colour and/or texture indicates transition from sidewalk to "flex space".

P3.2 Line streets with diverse mix of resilient canopy trees.
Min 15 m^3 soil volume per tree

P4.1 A coordinated family of street furnishings.

P5.1 Signage and wayfinding with a strong identity.

P7.1 Modify ground floor building facades for street-oriented uses.

P7.3 Articulate building facades at ground floor.

P7.4 Active ground floor uses.

Cyclists (C)

(Section 3.2)

C1.4 Designated shared cycling lane.
Shared Lane: 4.0 to 4.5 m wide

C3.2 Short term bicycle parking area.

Transit (T)

(Section 3.3)

T1.1 Allow efficient movement of buses.

T2.2 Connect local bus stop and Confederation Line station entrance on the same side of the street.

T2.3 Highly Visible Confederation Line station entrance with clear and appealing pedestrian approaches.

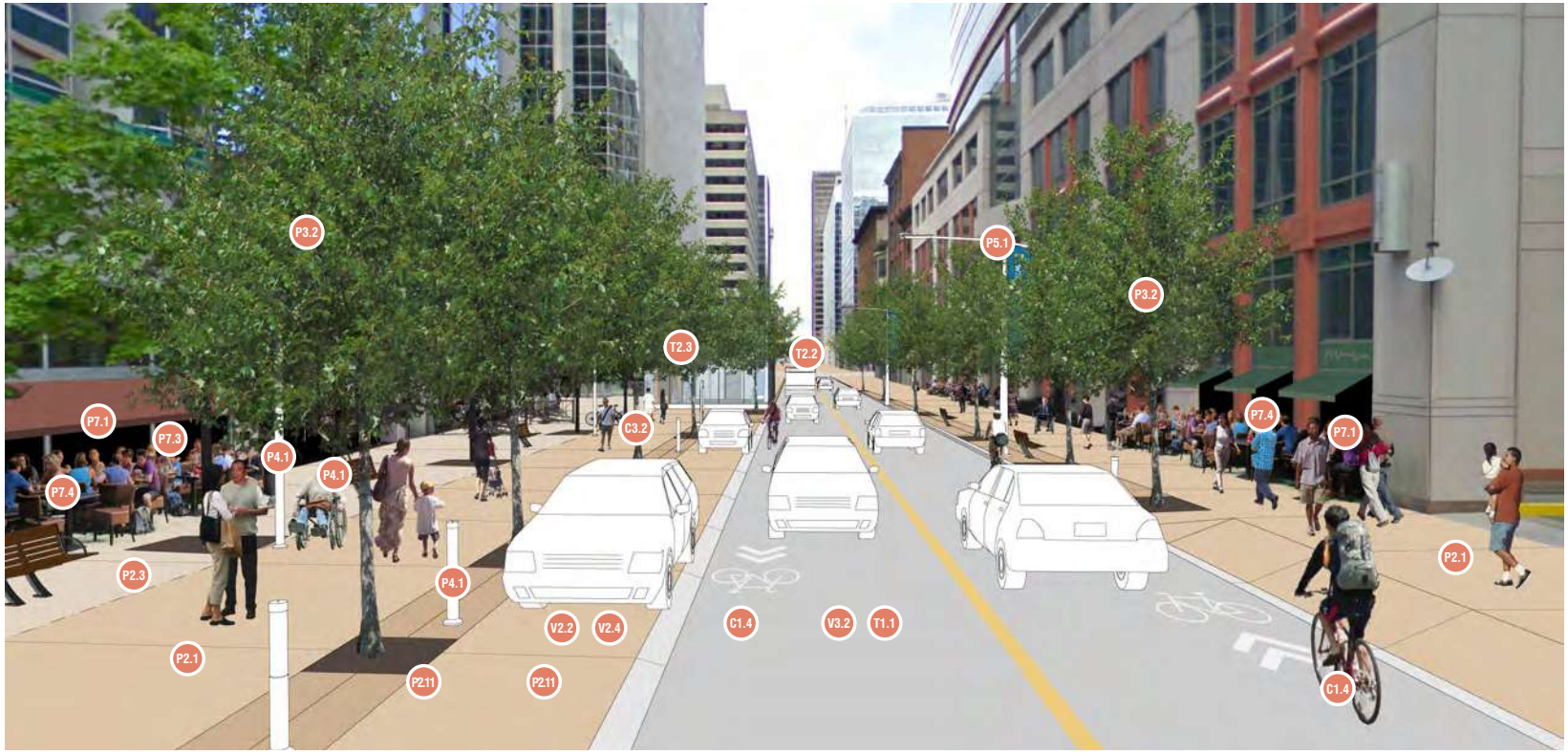
Vehicles (V)

(Section 3.4)

V2.2 Parking area on "flex space" at sidewalk level accessed by mountable curb.
Min 2.3 m wide

V2.4 Loading/taxi stand on "flex space" at sidewalk level accessed by mountable curb.
Min 2.4 m wide

V3.2 Vehicle lanes standardized and minimized.
Shared Lane: 4.25 to 4.5 m wide



Demonstration 1: Queen St (west of O'Connor St)

This demonstration highlights the wider sidewalks near the Confederation Line Downtown East station, showing the adjacent curb areas as flexible spaces that can be used as parking or enlarged sidewalks. Cycling is shared with vehicles that will be travelling at lower speeds, creating a safer environment for pedestrians.

* Markers in demonstration refer to corresponding sections in Section 3, Street Design Toolkit

Demonstration 2

Albert St (at Lyon St)

Pedestrian (P)

(Section 3.1)

P2.1 Sidewalk width that corresponds to anticipated pedestrian use.
Min 3.0 m wide

P2.3 Extend pedestrian zone paving to building edge.

P2.6 Crosswalk widths that are scaled to the clear width of sidewalks at the approaches.
Min 3.0 m wide

P2.8 Pedestrian priority at crosswalk indicated by distinctive material.

P2.10 Raised "table top" intersection.

P3.2 Line streets with diverse mix of resilient canopy trees.
Min 15 m^3 soil volume per tree

P4.1 A coordinated family of street furnishings.

P5.1 Signage and wayfinding with a strong identity.

P7.1 Modify ground floor building facades for street-oriented uses.

P7.2 Tall buildings have a podium.

P7.3 Articulate building facades at ground floor.

P7.4 Active ground floor uses.

P7.8 Corner building frames intersection.

Cyclists (C)

(Section 3.2)

C1.3 Unidirectional vertically separated cycling facility.
Min 1.8 m wide

C2.5 Markings indicate cycling route as it crosses intersection.

C3.2 Short term bicycle parking area.

Transit (T)

(Section 3.3)

T1.1 Allow efficient movement of buses.

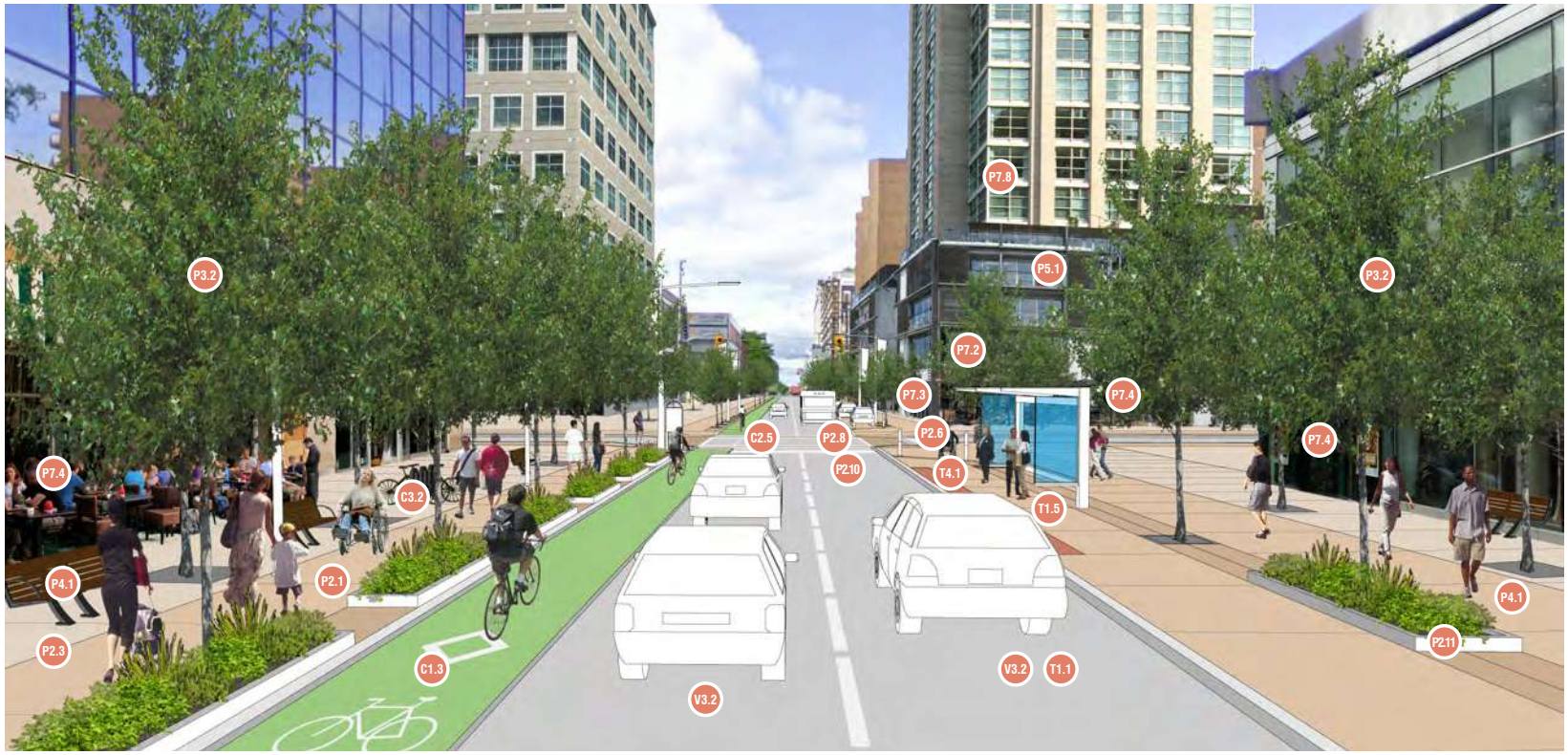
T1.5 Curbside loading areas.
1.5 to 3.0 m wide

T4.1 Use bus bulges to provide priority at bus transit stops.

Vehicles (V)

(Section 3.4)

V3.2 Vehicle lanes standardized and minimized.
Curb Lane: 3.5 m wide



Demonstration 2: Albert St (at Lyon St)

This demonstration illustrates an opportunity to introduce a separated bicycle facility on the left side of Albert Street in order to avoid conflicts with buses that circulate and stop to load and unload transit customers on the right side of the street. Sidewalks have been widened to allow for a safe pedestrian environment and animation of the street with patios and outdoor cafes.

* Markers in demonstration refer to corresponding sections in Section 3, Street Design Toolkit

Demonstration 3

Slater St (west of Metcalfe St)

Pedestrian (P)

(Section 3.1)

P2.1 Sidewalk width that corresponds to anticipated pedestrian use.
Min 3.0 m wide

P3.2 Line streets with diverse mix of resilient canopy trees.
Min 15 m^3 soil volume per tree

P3.7 Plant shrubs, perennials and grasses for complete, diverse and durable landscapes.

P3.8 Ground water recharge to improve soil and vegetation environment.

P4.1 A coordinated family of street furnishings.

P5.1 Signage and wayfinding with a strong identity.

P7.1 Modify ground floor building facades for street-oriented uses.

P7.4 Active ground floor uses.

Cyclists (C)

(Section 3.2)

C1.3 Unidirectional vertically separated cycling facility.
Min 1.8 m wide

C3.2 Short term bicycle parking area.

Transit (T)

(Section 3.3)

T1.1 Allow efficient movement of buses.

T1.5 Curbside loading areas.
1.5 to 3.0 m wide

T1.6 Incorporate surface texture changes at transit stops to assist the visually challenged.

T4.1 Use bus bulges to provide priority at bus transit stops.

Vehicles (V)

(Section 3.4)

V2.2 Parking area on "flex space" at sidewalk level accessed by mountable curb.
Min 2.3 m wide

V2.4 Loading/taxi stand on "flex space" at sidewalk level accessed by mountable curb.
Min 2.4 m wide

V3.2 Vehicle lanes standardized and minimized.
Curb Lane: 3.5 m wide

Demonstration 3: Slater St (west of Metcalfe St)

This demonstration depicts the addition of a separated cycling facility to the north side of Slater Street and the provision of widened sidewalks through the removal of the bus-only travel lane. Transit customers are well accommodated in bus shelters and the building edge is animated with street-oriented retail.

* Markers in demonstration refer to corresponding sections in Section 3, Street Design Toolkit

Demonstration 4

Slater St (west of Metcalfe St) as Two-Way

Pedestrian (P)

(Section 3.1)

P2.1 Sidewalk width that corresponds to anticipated pedestrian use.
Min 3.0 m wide

P211 Mountable curbs create "flex space". Paving colour and/or texture indicates transition from sidewalk to "flex space".

P3.2 Line streets with diverse mix of resilient canopy trees.
Min 15 m^3 soil volume per tree

P3.7 Plant shrubs, perennials and grasses for complete, diverse and durable landscapes.

P3.8 Ground water recharge to improve soil and vegetation environment.

P4.1 A coordinated family of street furnishings.

P5.1 Signage and wayfinding with a strong identity.

P7.1 Modify ground floor building facades for street-oriented uses.

P7.4 Active ground floor uses.

Cyclists (C)

(Section 3.2)

C1.4 Cyclists share travel lanes with vehicular traffic.
Shared Lane: 3.5 m wide

Transit (T)

(Section 3.3)

T1.1 Allow efficient movement of buses.

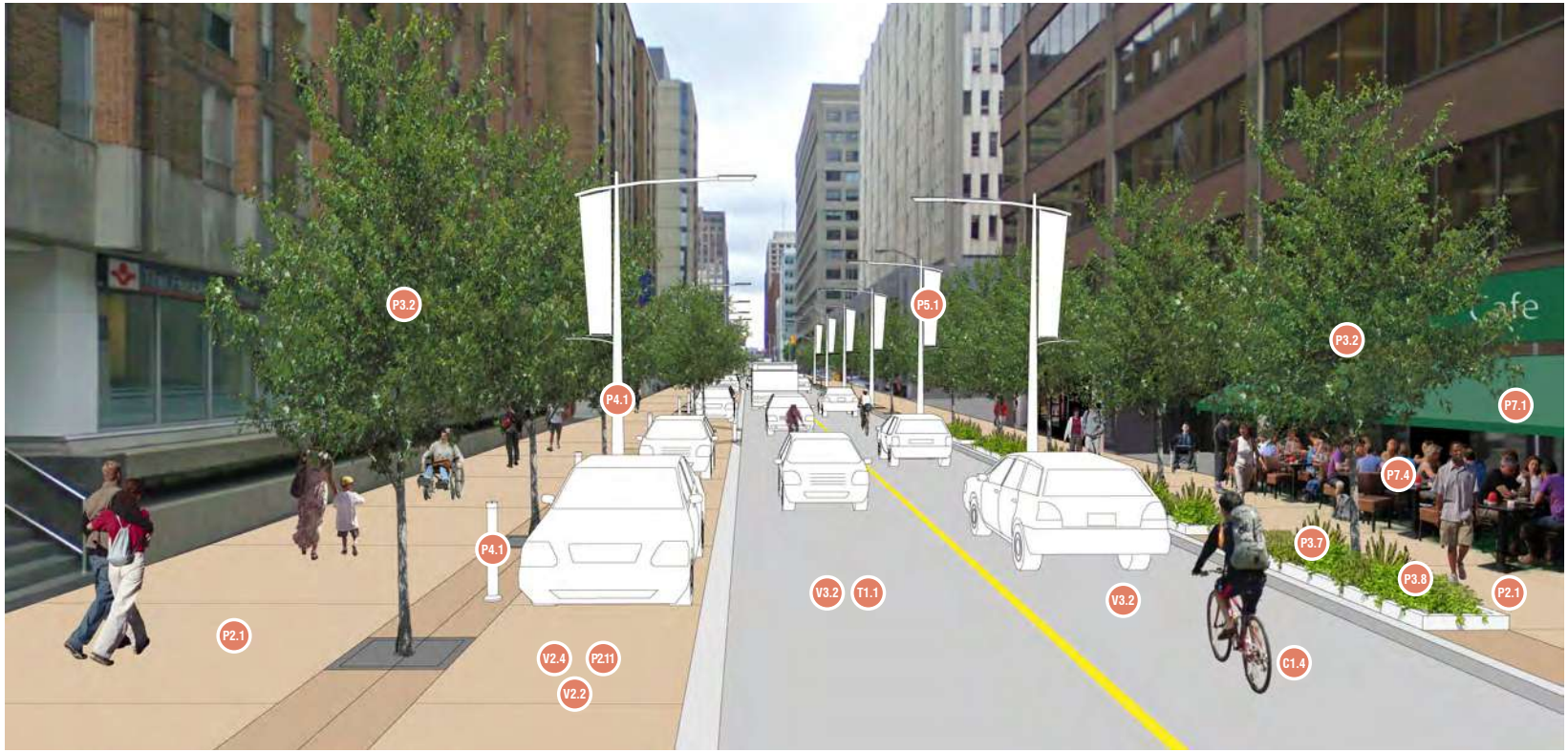
Vehicles (V)

(Section 3.4)

V2.2 Parking area on "flex space" at sidewalk level accessed by mountable curb.
Min 2.3 m wide

V2.4 Loading/taxi stand on "flex space" at sidewalk level accessed by mountable curb.
Min 2.4 m wide

V3.2 Vehicle lanes standardized and minimized.
Curb Lane: 3.5 m wide



Demonstration 4: Slater St (west of Metcalfe St) as Two-Way

This demonstration envisions Slater Street as a two-way street. Cyclists share lane space with vehicles and parking can be accommodated within flexible spaces. Widened sidewalks provide additional space for pedestrians and on-street planting, and the building edge is animated with street-oriented retail.

* Markers in demonstration refer to corresponding sections in Section 3, Street Design Toolkit

Demonstration 5

Metcalfe St (at Sparks St)

Pedestrian (**P**)

(Section 3.1)

P2.1 Sidewalk width that corresponds to anticipated pedestrian use.
Min 3.0 m wide

P2.8 Pedestrian priority at crosswalk indicated by distinctive material.

P2.10 Pedestrian priority intersection with raised "table top".

P3.2 Line streets with diverse mix of resilient canopy trees.
Min 15 m^3 soil volume per tree

P4.1 A coordinated family of street furnishings.

P7.4 Active ground floor uses.

P8.13 Include elements to activate the street edge.

Cyclists (**C**)

(Section 3.2)

C1.3 Unidirectional vertically separated cycling facility.
Min 1.8 m wide

Transit (**T**)

(Section 3.3)

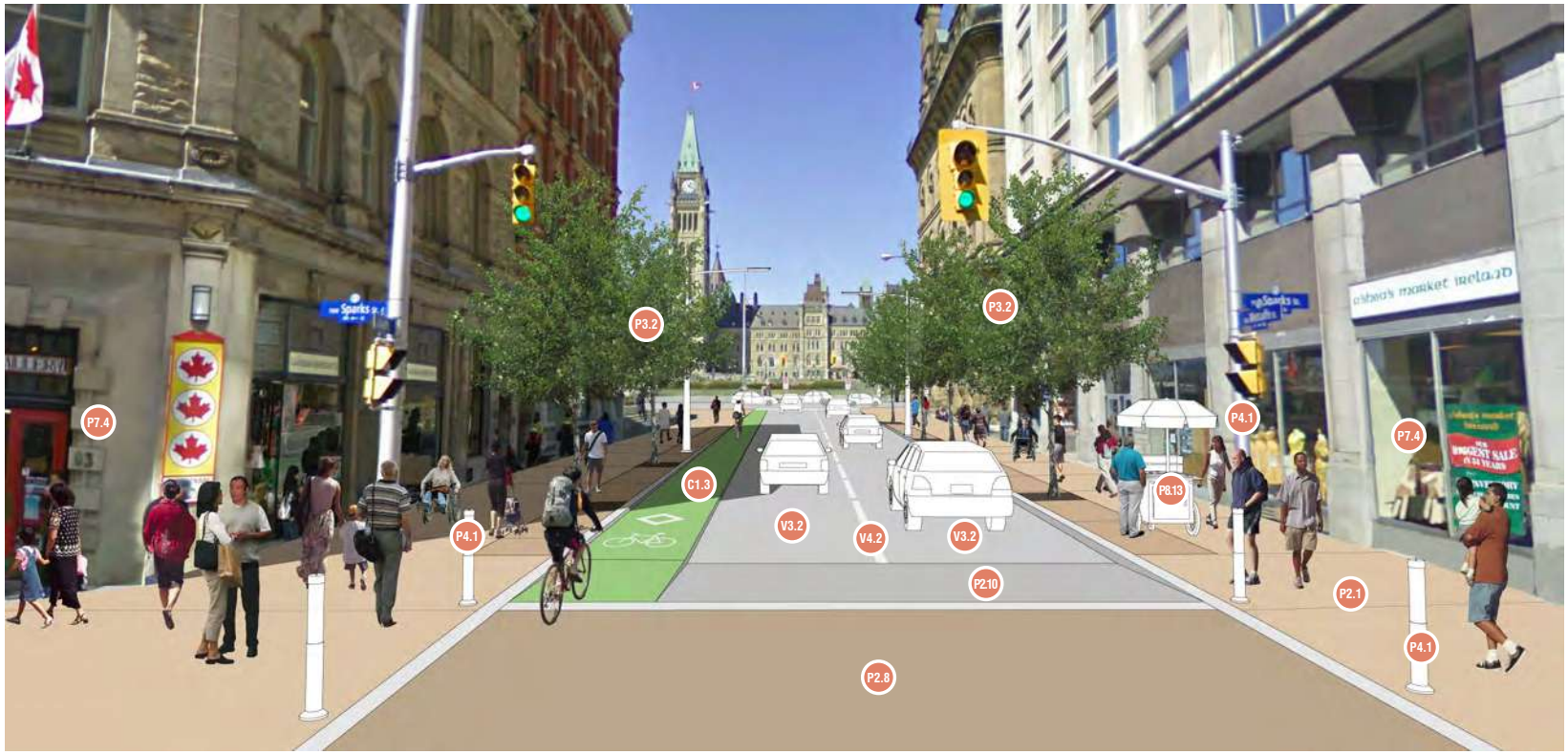
Note: Transit service not provided on Slater Street in this demonstration.

Vehicles (**V**)

(Section 3.4)

V3.2 Vehicle lanes standardized and minimized.
Curb Lane: 3.5 m wide

V4.2 Retaining one way street configuration to reduce delays and potential cyclist conflicts with turning.



Demonstration 5: Metcalfe St (at Sparks St)

This demonstration illustrates Metcalfe Street enhanced with widened sidewalks and planting on both sides of the street. Additionally, a separated cycling facility is provided on the west side of the street.

* Markers in demonstration refer to corresponding sections in Section 3, Street Design Toolkit

Demonstration 6

Wellington St (at Elgin St)

Pedestrian (P)

(Section 3.1)

P2.1 Sidewalk width that corresponds to anticipated pedestrian use.
- Min 3.0 m wide

P5.8 Integrate signage with Confederation Line signage and existing NCC system.

Cyclists (C)

(Section 3.2)

C1.3 Bidirectional vertically separated cycling facility.
- Min 3.0 m wide

C3.2 Short term bicycle parking area.

C4.1 Place bike sharing stations.

Transit (T)

(Section 3.3)

T1.1 Allow efficient movement of buses.

Vehicles (V)

(Section 3.4)

V3.2 Vehicle lanes standardized and minimized.
- Curb Lane: 3.5 m wide
- Median Lane: 3.25 m wide
- Turn Lane: 3.0 to 3.25 m wide

Demonstration 6: Wellington St (at Elgin St)

This demonstration depicts the reconfiguration of Wellington Street to accommodate a bidirectional separated cycling facility. This facility continues to the Portage Bridge, forming a vital link of an inter-provincial bike loop. One left turn lane at Wellington and Elgin Streets is removed.

* Markers in demonstration refer to corresponding sections in Section 3, Street Design Toolkit

Demonstration 7

War Memorial Triangle

Pedestrian (P)

(Section 3.1)

P2.1 Sidewalk width that corresponds to anticipated pedestrian use.
- Min 3.0 m wide

P2.8 Pedestrian priority at crosswalk indicated by distinctive material.

P3.2 Line streets with diverse mix of resilient canopy trees.
- Min 15 m^3 soil volume per tree

P10.2 Remove vehicular travel lanes or turn lanes to establish pedestrian priority at gateway sites.

Cyclists (C)

(Section 3.2)

C1.3 Bidirectional vertically separated cycling facility.
- Min 3.0 m wide

Unidirectional vertically separated cycling facility.
- Min 1.8 m wide

Transit (T)

(Section 3.3)

T1.1 Allow efficient movement of buses.

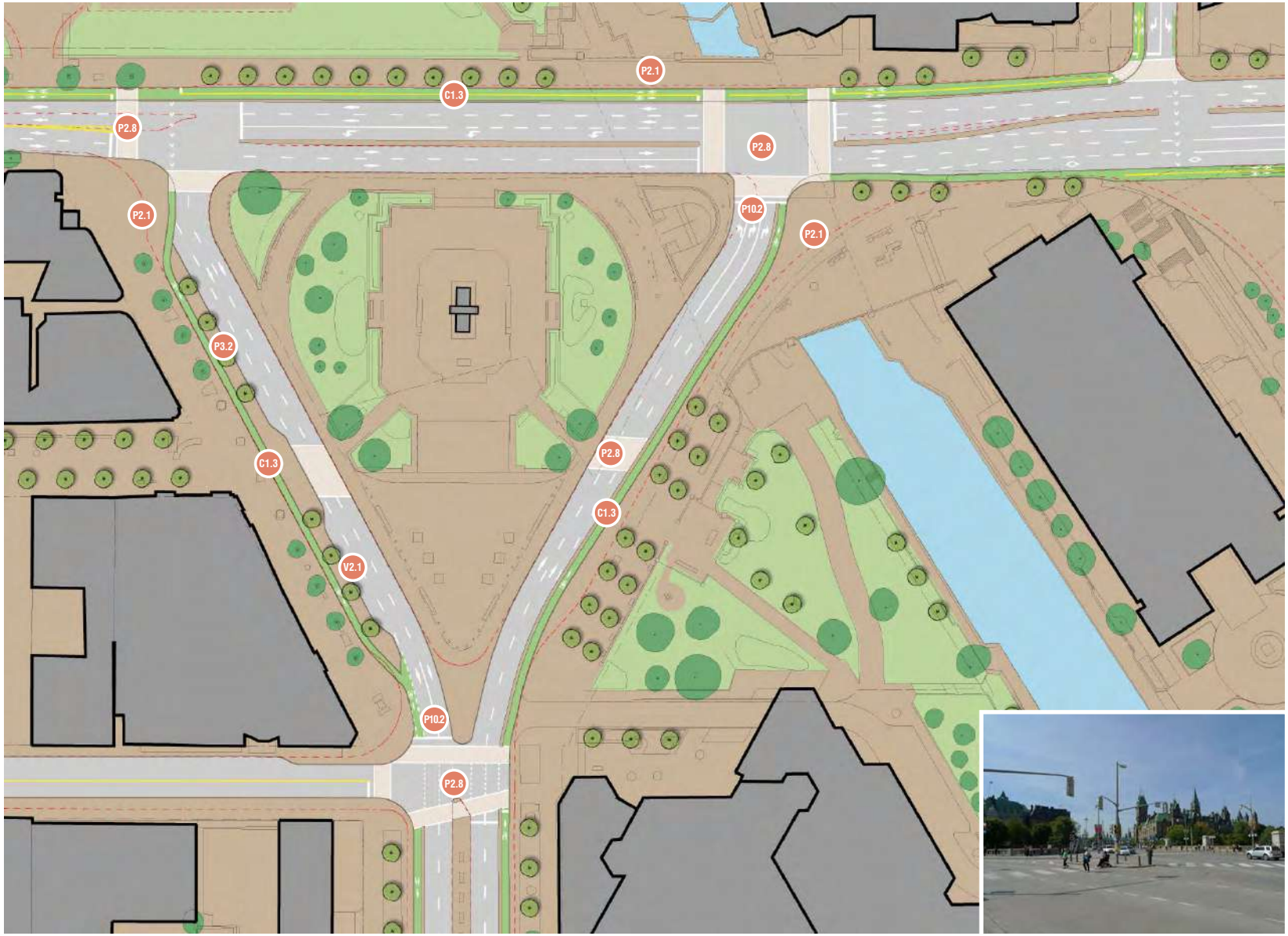
Vehicles (V)

(Section 3.4)

V2.1 Parking areas to serve short term needs of local businesses.

V3.2 Vehicle lanes standardized and minimized.
- Curb Lane: 3.5 m wide
- Median Lane: 3.25 m wide
- Turn Lane: 3.25 m wide

This demonstration depicts the elimination of vehicle travel lanes and the simplification of intersections around the War Memorial Triangle to establish gains in sidewalk space for pedestrians and cycling comfort in the form of separated bike lanes.



Demonstration 7: War Memorial Triangle

* Red dashed line indicates existing curb location

* Markers in demonstration refer to corresponding sections in Section 3, Street Design Toolkit

Demonstration 8

Mackenzie King/Nicholas/Waller Connection

Pedestrian (P)

(Section 3.1)

P2.1 Sidewalk width that corresponds to anticipated pedestrian use.
- Min 3.0 m wide

P2.8 Pedestrian priority at crosswalk indicated by distinctive material.

P3.2 Line streets with diverse mix of resilient canopy trees.
- Min 15 m^3 soil volume per tree

P3.7 Plant shrubs, perennials and grasses for complete, diverse and durable landscapes.

Cyclists (C)

(Section 3.2)

C1.3 Bidirectional vertically separated cycling facility.
- Min 3.0 m wide

Unidirectional vertically separated cycling facility.
- Min 1.8 m wide

C2.2 Provide bike boxes to make bicycles more visible.

C2.5 Markings indicate cycling route as it crosses intersection.

Transit (T)

(Section 3.3)

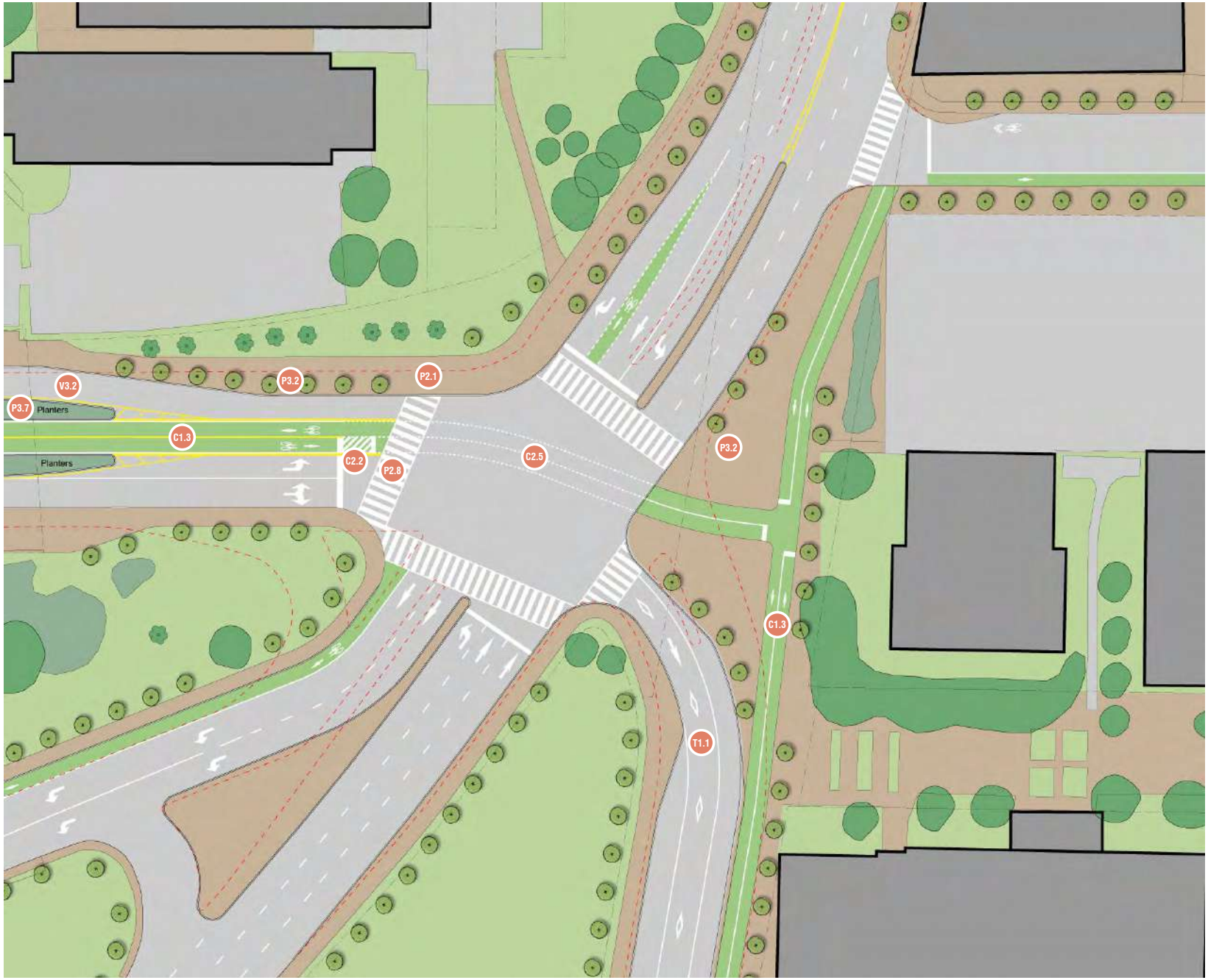
T1.1 Allow efficient movement of buses.

Vehicles (V)

(Section 3.4)

V3.2 Vehicle lanes standardized and minimized.
- Curb Lane: 3.5 m wide
- Median Lane: 3.25 m wide
- Turn Lane: 3.25 m wide

This illustration shows the widening of sidewalks along the intersection of Mackenzie King, Nicholas and Waller streets to improve the pedestrian environment and to narrow the intersection crossings. It also introduces new bicycle facilities along Waller and Nicholas streets to enhance the connection between the Sandy Hill community and the University of Ottawa to downtown via Mackenzie King Bridge and to Lowertown via Nicholas Street.



Demonstration 8: Mackenzie King/Nicholas/Waller Connection

* Red dashed line indicates existing curb location

* Markers in demonstration refer to corresponding sections in Section 3, Street Design Toolkit

Demonstration 9

Bronson/Albert/Slater Connection

Pedestrian (P)

(Section 3.1)

P2.1 Sidewalk width that corresponds to anticipated pedestrian use.
- Min 3.0 m wide

P2.8 Pedestrian priority at crosswalk indicated by distinctive material.

P3.2 Line streets with diverse mix of resilient canopy trees.
- Min 15 m^3 soil volume per tree

P10.1 Create gateways through landscaping, streetscaping, and built form elements.

Cyclists (C)

(Section 3.2)

C1.3 Bidirectional vertically separated cycling facility.
- Min 3.0 m wide

Unidirectional vertically separated cycling facility.
- Min 1.8 m wide

C2.5 Markings indicate cycling route as it crosses intersection.

C4.1 Place bike sharing stations.

Transit (T)

(Section 3.3)

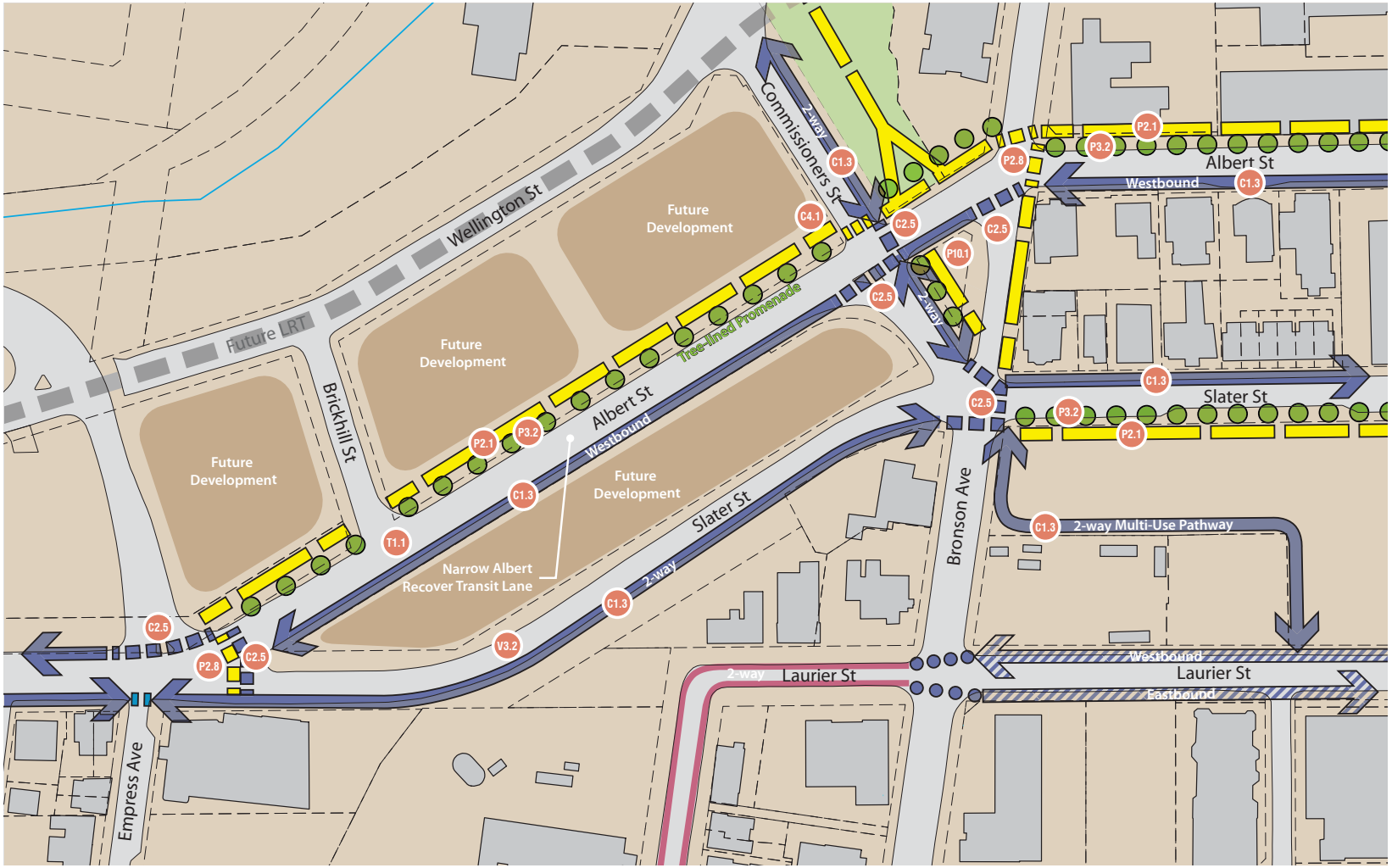
T1.1 Allow efficient movement of buses.

Vehicles (V)

(Section 3.4)

V3.2 Vehicle lanes standardized and minimized.
- Curb Lane: 3.5 m wide
- Median Lane: 3.25 m wide
- Turn Lane: 3.25 m wide

This illustration shows the introduction of separated cycling facilities on Albert and Slater streets improving the connection between downtown to Lebreton Flats. It also introduces a new multi-use pathway connecting the existing Laurier Avenue bicycle lanes to Slater Street.



Proposed Tree-Lined Pedestrian Promenade
Proposed Separated Cycling Facility
Proposed Cycling Crossing
Existing Shared Lane
Existing Separated Cycling Facility
Existing Cycling Crossing

Demonstration 9: Bronson/Albert/Slater Connection

* Markers in demonstration refer to corresponding sections in Section 3, Street Design Toolkit

Demonstration 10

Mackenzie King Bridge (looking east)

Pedestrian (P)

(Section 3.1)

P2.1 Sidewalk width that corresponds to anticipated pedestrian use.
Min 3.0 m wide

P3.6 Use unique combinations of landscape species.

P3.7 Plant shrubs, perennials and grasses for complete, diverse and durable landscapes.

P4.1 A coordinated family of street furnishings.

P5.1 Signage and wayfinding with a strong identity.

P7.1 Modify ground floor building facades for street-oriented uses.

P7.4 Active ground floor uses.

Cyclists (C)

(Section 3.2)

C1.3 Bidirectional vertically separated cycling facility.
Min 3.0 m wide

Transit (T)

(Section 3.3)

T1.1 Allow for efficient movement of buses to support future growth and increased transit mode share objectives.

T1.5 Curbside loading areas.
1.5 to 3.0 m wide

Vehicles (V)

(Section 3.4)

V1.3 Introduce physical traffic calming measures.

V3.2 Vehicle lanes standardized and minimized.
Curb Lane: 3.5 m wide

Demonstration 10: Mackenzie King Bridge

This demonstration illustrates the opportunity to enhance the comfort of the Mackenzie King Bridge for pedestrians and cyclists while maintaining suitable accommodation for bus service. A bidirectional cycling facility runs along the centre of the bridge and the reconfiguration of bus and vehicle lanes creates space for planting.

* Markers in demonstration refer to corresponding sections in Section 3, Street Design Toolkit

Demonstration 11

Mackenzie King Bridge (looking west)

Pedestrian (**P**)

(Section 3.1)

P2.1 Sidewalk width that corresponds to anticipated pedestrian use.
Min 3.0 m wide

P3.6 Use unique combinations of landscape species.

P3.7 Plant shrubs, perennials and grasses for complete, diverse and durable landscapes.

P4.1 A coordinated family of street furnishings.

Cyclists (**C**)

(Section 3.2)

C1.3 Bidirectional vertically separated cycling facility.
Min 3.0 m wide

Transit (**T**)

(Section 3.3)

T1.1 Allow for efficient movement of buses to support future growth and increased transit mode share objectives.

Vehicles (**V**)

(Section 3.4)

V3.2 Vehicle lanes standardized and minimized.
Curb Lane: 3.5 m wide

Demonstration 11: Mackenzie King Bridge

This demonstration illustrates the opportunity to enhance the comfort of the Mackenzie King Bridge for pedestrians and cyclists while maintaining suitable accommodation for bus service. A bidirectional cycling facility runs along the centre of the bridge and the reconfiguration of bus and vehicle lanes creates space for planting.

* Markers in demonstration refer to corresponding sections in Section 3, Street Design Toolkit

5 Implementation

5.1 Street Life-Cycle Planning & Costing

5.2 Master Plan for Renewal of Downtown Ottawa Streets

5.3 Delivering the Vital Moves as Priorities

5.4 Environmental Assessment of the Downtown Moves “Master Plan”

5.5 Implementation Actions

This section outlines an implementation strategy that will guide the pursuit of the Downtown Moves Vision and Strategic Directions to be realized. The strategy expresses Downtown Moves as a number of potential projects and actions, including a few potential “big moves”. The general EA process and financial implications are also discussed.

5.1 Street Life-Cycle Planning & Costing

This Downtown Moves report proposes a new Vision and Strategic Directions to guide the long term, incremental renewal of the downtown streets in a manner that strikes an appropriate balance in the allocation of space within its narrow right-of-ways. Throughout the study process, it became increasingly clear that to meet the future needs of the growing downtown and the aggressive ridership targets for the Confederation Line, the status quo is not an option. Modifications to streets are essential to pursue a more pedestrian, cycling, and transit friendly street environment, to support and leverage the City's investment in LRT, and to best enable the continued economic development and community strengthening of downtown Ottawa.

The report proposes a new decision-making and design framework, a planning and design toolkit, and a new set of candidate "complete street" designs that are applicable to various contexts downtown. In addition, a series of "demonstrations" have been prepared that help fuel the imagination of how the complete street designs could be implemented through future investments in street renewal over the next 5, 10 and 20 year horizon.

However, it is important to note that few street segments in downtown Ottawa are scheduled for infrastructure renewal in the City's five-year capital plan. At this time, no street segments have been identified as requiring "integrated road, water, and sewer" rehabilitation. This is the program which has successfully led to the renewal of several of the City's important inner city streets, including designated Traditional Mainstreets and Theme Streets, where greatly enhanced streetscape improvements were provided as a portion of the overall integrated project. Hence, funding of any new street renewal capital projects and all other physical interventions on downtown Ottawa streets will require integration into the capital work and rehab and renewal planning and priorities, coupled with City Council support and financing solutions over a long-term period. On this basis, it is important to think of the renewal of downtown streets to pursue the Downtown Moves Vision as a series of inter-related "projects". Some projects will be "priority projects" that will need to be funded and implemented on their own or in coordination with the construction of major works projects such as the Confederation Line or the de-commissioning of the Transitway. Others will be contributing projects that can be implemented incrementally over time, and some may not be within the time frame of the City's Official Plan (20 years).

The Vision established by Downtown Moves sets a new expectation for the quality of design of downtown streets as functional, comfortable, and efficiently designed public spaces. Given that all streets will be reconstructed during their life-cycle, it will be the major outcome of Downtown Moves that streets will be recreated with an appropriate level of service that is higher than the current baseline to meet future needs and growth projected for pedestrians, cyclists and transit users in particular.

Table 5-1 provides a comparison of the current typical "basic" level of service (based on a windshield survey) compared to a new "enhanced" streetscape standard that is proposed for downtown Ottawa streets which will fulfill the priorities, values and vision in Downtown Moves. Recent examples of "enhanced" quality streetscape can be seen in recent renewal along Preston, Bank, Somerset, and Wellington Street West streets.

Wellington Street West, Ottawa, ON

Existing Level of Service of Downtown Ottawa Streetscapes (Basic Treatment)	Proposed Level of Service for Downtown Ottawa Streetscapes (Enhanced Treatment)
• Standard width concrete sidewalks • Paint on asphalt for crosswalks, parking bays • Post and ring bike racks (sparse) • Street trees (when present) widely spaced in paved boulevard • Limited quantities of street furniture normally associated with adjacent development • Street lighting and traffic plant on tall standard grey aluminum or concrete poles • Basic bus stop which may include a waste container • Minimum accessibility standards	• Increase in the surface area of sidewalk zone and decrease in the surface area of roadway (asphalt) area • Distinctive surfaces for sidewalks, crosswalks, and parking bays, often using durable paving stone or patterned concrete • Post and ring bike racks (frequent) • Street trees with appropriate sub-grade planting and tree guard provisions • Protective bollards to define edges of public spaces • Street furniture including benches and waste/recycling containers • Distinctive street lighting, often including pedestrian-level and/or mid-height poles and including banner arms • Traffic plant on colour matching poles • Bus stops with amenities including shelters, benches, waste container, etc. • Accessibility facilities and amenities • Public art installations • Opportunities for special amenities such as: way finding signage, floral displays and planters, electrical outlets, Wi-Fi, music, and temporary kiosks when implemented in partnership with BIAs or others
Examples: Existing Queen Street, O'Connor Street, Metcalfe Street, Albert and Slater Streets, and Elgin south of Lisgar Street	Examples: Preston Street, Bank Street, Wellington Street West, Somerset Street West, and Rideau Street east of Dalhousie

Table 5-1: An Appropriate Level of Service for Downtown Ottawa Streetscapes

Potential downtown street renewal capital projects and their corresponding components will often fall into one of the classes shown on Table 5-2. This table illustrates the cost per linear metre of street reconstruction which includes the enhanced level of service that will support of the vision established for Downtown Moves.

These "ball park" cost figures enable the development of preliminary budgetary cost estimates of segment by segment design and construction costs for the potential renewal of streets in downtown Ottawa, and the additional investment that would be associated with reconstruction to an appropriate level-of-service. Actual projects and priorities for renewal can be established during the City's long term asset planning processes. Contingencies and annual cost escalations should be added as appropriate.

Based on the *Case for Making Moves* (Section 1.8) and the *Strategic Directions* (Section 2.3) the "enhanced" level of service meets future needs while the "basic" will not. It is important to understand the amount of additional cost, or the "delta", of this enhanced standard of street design over and above the basic treatment. The additional cost of the enhanced treatment is attributed primarily to the additional infrastructure components provided in the road edge and sidewalk zone. The more "enhanced" components included in a streetscape plan are, the greater the cost and the greater the difference from typical standards.

Quality street lights and sidewalk surfaces are a large portion of additional cost is attributed to the delivery of enhanced streetscapes as opposed to basic tall mount street lights and a basic concrete sidewalk surface of a typical street. The design/construction cost of these enhanced elements, for a street cross-section with sidewalks in the range of 3.0 to 3.25m wide (such as Complete Street Type D5 in Section 3.6), is approximately $2,100/m. This is the linear cost for both sidewalks, including "mega pavers", sub-grade, curbs and all aspects of the street light system. By comparison, the cost of the basic treatment is approximately $950/m. The delta or difference is approximately $1,150/m. While the comparative cost difference is notable, the relative proportion of the overall street improvement project costs is less, and diminishes as the overall scope of the street renewal project increases to include more components (see Table 5-2). Based on the construction costs for recently completed "Traditional Mainstreets" in Ottawa, the additional cost of delivering enhanced quality of street lighting and sidewalks,

Street Renewal Project Class		Street Infrastructure Components Renewed With Enhanced Treatment	Approximate Design & Construction Cost per Linear Metre (Assuming Sidewalks Approximately 3m Wide in 18m Right-of-Way)
1	Coordinated Total (full-depth) Reconstruction	Municipal services & utilities, traffic signal plant, road surface and subgrade, curbs & drainage, street lighting, sidewalks, and streetscaping elements	$14,000 to $17,000
2	Street Surface Rearrangement and Streetscaping	Traffic signal plant, road surface and subgrade, curbs & drainage, street lighting, sidewalks and streetscaping	$8,500 to $10,500
3	Streetscaping-only	Road resurfacing, new curbs, street lighting, sidewalks and streetscaping	$4,500 to $5,500

Note: The cost data is based on actual construction tender bid analyses for recent inner City "Traditional Mainstreet" street reconstruction projects including Wellington Street Reconstruction Project (Western to Garland), Somerset Street West (Preston to Booth), Rideau Street (Dalhousie to Chapel), and Bank Street (Hwy 417 to Canal), factored to 2013 dollars. The costs assume the entire width of the right-of-way is renewed and that only minor amounts of utility reconstruction is required. The cost includes a 25% allowance for design and construction services.

Table 5-2: Downtown Street Renewal Classes and Costs

when expressed as a percentage of the overall project cost, is approximately:

- 6.8 to 8.2% of Coordinated Total Reconstruction projects; and
- 11 to 13.5% of Surface Rearrangement with Streetscaping with projects.

Additional streetscaping elements can be layered onto the decorative street lighting and sidewalk surface investment to complete the enhanced street design. These elements, and their approximate unit costs for design/construction, include:

- Street Trees and Planting Media at $6,000;
- Benches at $2,500;
- Waste Receptacles at $1,500;
- Bollards at $1,500; and
- Post and Ring Bike Racks at $1,000.

When provided in the street design at an appropriate frequency commensurate with the vision for downtown streets, these elements account for approximately $1,700/m. When delivering an enhanced road edge with quality street lighting and sidewalk surfaces, together with additional streetscape elements, the total delta cost or difference for the enhanced treatment above the basic treatment is approximately $2,850/m. This additional cost, when expressed as a percentage of the overall project cost, is approximately

- 17% to 20% of Coordinated Total Reconstruction projects; and
- 27% to 34% of Surface Rearrangement with Streetscaping projects.

In regards operating and maintenance costs, it is important to note that streets in downtown Ottawa are currently maintained to a high level of service within the City's hierarchy of area maintenance standards. The cost of maintaining streets that are constructed to an appropriate downtown level are not anticipated to be appreciably higher than streets constructed to the previous basic level. Life-cycle costs can be further managed through the following activities:

- For each renewal project, providing an Operating and Maintenance Manual that items the materials utilized;
- When tendering a renewal project, require additional quantities of certain materials to be retained as a surplus for replacement;
- Using materials that can be sourced when needed to be replaced (and when no surplus is retained);
- Selecting durable materials that are appropriate to the harsh urban and climatic conditions faced in downtown Ottawa;
- Designing streets to protect vulnerable items, such as aligning street lights, trees and bike racks along the curb zone with an offset that is consistent with snow management operations in particular.

In addition to municipal life-cycle planning considerations, there may be opportunities for cost sharing with the NCC, considering the NCC's established role in cost-sharing the construction, operation and maintenance of Confederation Boulevard which includes segments of Wellington Street, Elgin Street, and MacKenzie Avenue in downtown Ottawa. There are also opportunities for private sector construction financing or cost sharing of portions of streets that are adjacent to land development proposals, particularly projects with longer street frontages (perhaps one-quarter block length or larger). These opportunities should be explored during the municipal development approval process. Furthermore, there are opportunities for life-cycle cost partnering with the BIAs or other community partners operating in downtown Ottawa on such items as banners, seasonal lighting/planting, artistic installations, promotion, etc.

5.2 Master Plan for Renewal of Downtown Ottawa Streets

As established in Section 1.5, the Downtown Moves project has been conducted using the "Master Plan" approach in regards to Ontario's Environmental Assessment Act (EAA). Furthermore, it is important to consider the cost implications of potential capital projects, considering the cost factors presented in Section 5.1. Accordingly, it is necessary to translate the Downtown Moves initiative into many individual "projects", by using the following planning process:

1. Identify each street segment downtown as categorized discretely on the Plan of Streets (Figure 7).
2. Review the Vision Plans (mobility overlays) that apply to that segment, and the adjoining segments of the entire street.
3. Review the Complete Street Design Solutions (Section 3) that may best respond to the design aspirations for that segment within the context of the entire street.
4. Identify the segment as a potential discrete capital project, understanding that adjoining segments could be bundled together as individual projects.

The resulting list or master plan of potential projects is provided on Table 5-3. As the Complete Street Design Solutions all pertain to the typical 18.3m right-of-way of downtown streets, options for streets that are wider, or subject to ongoing street renewal projects, are detailed in the 'notes' column of the table.

It is important to note that this "master planning" exercise and the resulting Table 5-3 merely identify a design direction coupled with a short list of potential designs for any given street segment. The actual design to be pursued would be decided through a more specific project scoping and "functional design" process used in the City of Ottawa. This is a multi-disciplinary process that is informed by highly detailed, site-specific analyses and by appropriate stakeholder consultation.

Street Segment	From	To	Length	Street Type	Complete Street Designs to Consider	Notes
Albert	Elgin	Bay	1800m	Business	D1, D3, D4, E	To include dedicated bike facility in at least one direction. See Demonstration 2.
Albert	Bay	Bronson	240m	Downtown Neighbourhood	D1, D3, D4, E	To include dedicated bike facility in at least one direction. See Demonstration 2.
Albert	Bronson	Westerly	50m	Downtown Neighbourhood	D1, D3, D4, E	To include dedicated bike facility in at least one direction. See Demonstration 2.
Bank	Wellington	Southerly	540m	Main	A, B1, B2	
Bay	Wellington	Southerly	540m	Downtown Neighbourhood	D1, D3, D4, E	Only one travel vehicle lane required.
Besserer	Waller	Nicholas	150m	Business	B1	No parking needed.
Besserer	Easterly	Waller	100m	Downtown Neighbourhood	D3	Bike facility may not be needed.
Bronson	Sparks	Gloucester	390m	Downtown Neighbourhood	A	
Bronson	Gloucester	Southerly	30m	Main	N/A	To be addressed through Bronson Street Renewal Project.
Colonel By	Rideau	Southerly	860m	Ceremonial	N/A	
Dalhousie	Besserer	Northerly	120m	Main	A	
Daly	Waller	Colonel By	400m	Business	A	
Elgin	Wellington	Southerly	600m	Ceremonial	N/A	Consider incorporating parking on the west side of the street with the use of bulb-outs. See Demonstration 8.
Gloucester	Elgin	Lyon	930m	Business	D1, D3, D4	Bike facility not needed.
Gloucester	Lyon	Bronson	430m	Downtown Neighbourhood	D1, D3, D4	Bike facility not needed.
Kent	Wellington	Sparks	90m	Ceremonial	D1, D2, D3, D4	Bike facility not needed.
Kent	Sparks	Gloucester	420m	Business	D5	Bike facility not needed.
Kent	Gloucester	Southerly	40m	Downtown Neighbourhood	D5	Bike facility not needed.
Laurier	Elgin	Lyon	940m	Business	N/A	Pending completion of segregated bicycle facility pilot project.
Laurier	Lyon	Bronson	910m	Downtown Neighbourhood	N/A	Pending completion of segregated bicycle facility pilot project.
Laurier	Bronson	Westerly	80m	Downtown Neighbourhood	C	Parking not needed.

Table 5-3: Potential Designs for Downtown Moves Street Segments

Street Segment	From	To	Length	Street Type	Complete Street Designs to Consider	Notes
Laurier	Waller	Elgin	590m	Business	N/A	Consider separated bike facilities on both sides. No parking needed.
Laurier	Easterly	Waller	210m	Downtown Neighbourhood	B2	With separated bike lanes on both sides. No parking needed.
Lyon	Wellington	Sparks	90m	Ceremonial	N/A	Distinct ceremonial treatment.
Lyon	Sparks	Laurier	330m	Business	D2, D3, D4, D5, E	
Lyon	Laurier	Southerly	110m	Downtown Neighbourhood	D2, D3, D4, D5, E	
Mackenzie	Rideau	Northerly	45m	Ceremonial	E, F	See Demonstration 8.
Mackenzie King	Waller	Elgin	580m	Business	N/A	Bi-directional facility in the middle. No parking needed.
Metcalfe	Wellington	Sparks	90m	Ceremonial	D1, D2, D3, D4, D5, E	
Metcalfe	Sparks	Gloucester	430m	Business	D1, D2, D3, D4, D5, E	In D1 configuration, consider impact of bike lane on parking garage entrance between Queen and Albert Streets
Metcalfe	Gloucester	Southerly	30m	Downtown Neighbourhood	D1, D2, D3, D4, D5, E	
O'Connor	Wellington	Sparks	90m	Ceremonial	D1, D2, D3, D4, D5, E	
O'Connor	Sparks	Gloucester	430m	Business	D1, D2, D3, D4, D5, E	In D2, D3, or D4 configuration, anticipate interaction between bus stops and bike lane
O'Connor	Gloucester	Southerly	30m	Downtown Neighbourhood	D1, D2, D3, D4, D5, E	
Queen	Elgin	Lyon	925m	Showcase	A, B1, C	
Queen	Lyon	Bay	150m	Business	A, B1, C	
Queen	Bay	Bronson	230m	Downtown Neighbourhood	B1, C	
Queen Elizabeth	Mackenzie King	Southerly	560m	Ceremonial	N/A	
Rideau	Easterly	Sussex	520m	Main	N/A	Being addressed through the Rideau Street Renewal Project
Slater	Elgin	Lyon	940m	Business	D1, D3, D4, E	To include dedicated bike facility in at least one direction
Slater	Lyon	Bronson	400m	Downtown Neighbourhood	D1, D3, D4, E	To include dedicated bike facility in at least one direction
Slater	Bronson	Westerly	55m	Downtown Neighbourhood	D1, D3, D4, E	To include dedicated bike facility in at least one direction

Table 5-3: Potential Designs for Downtown Moves Street Segments

Street Segment	From	To	Length	Street Type	Complete Street Designs to Consider	Notes
Sparks	Elgin	Lyon	890m	Plaza	N/A	Consider the implementation of a shared space between pedestrians and cyclists
Sparks	Lyon	Bay	150m	Business	A	
Sparks	Bay	Bronson	220m	Downtown Neighbourhood	D1, D3, D4	Bike facility not needed
Stewart	Easterly	Waller	85m	Downtown Neighbourhood	E	In E, include only one vehicle lane
Sussex	Rideau	Northerly	45m	Ceremonial	N/A	Addressed through the Sussex Drive Reconstruction Project
Transitway	Laurier	Nicholas	180m	Plaza	N/A	To be converted into a plaza street after the commencement of the Confederation Line service
Transitway	Waller	Laurier	170m	Downtown Neighbourhood	B2	In B2 configuration, include bicycle lanes on both sides of the street. No parking required
Wellington	Sussex	Portage Bridge	1.6km	Ceremonial	N/A	Similar to type F, but with two-way vehicle lanes. See Demonstration 6 and Demonstration 8.
Wilbrod	Tabaret Hall Pathway	Transitway	70m	Plaza	N/A	
William	George	Rideau	95m	Plaza	N/A	

Notes: Length is determined by the limits of the Study Area, as discussed in section 1.3 of this report.

The 'Complete Street Designs to Consider' merely identifies design options for a given street segment. The actual design is to be pursued through a specific "functional design" process.

Table 5-3: Potential Designs for Downtown Moves Street Segments

Within the many street segments document on Table 3, there are opportunities to advance important "Vital Moves" which have been identified as priorities during the civic dialogue promoted by Downtown Moves. These moves were introduced in Section 4.1, with many of them demonstrated in Section 4.2. Guidance in regards their delivery is provided on Table 5-4 and described below.

Within these vital moves, the following are isolated as the first priority moves. They are first priority due to their close association with the successful delivery and operation of the Confederation Line system, both in terms of contributing to the success of the Confederation Line service, and in regards to taking advantage of surplus street capability created by Ottawa's investment in light rail.

1. Secure Wider Sidewalks Near Transit Station Entrances

It is forecast that more than 5,000 persons will exit or enter the rapid transit station entrances in the peak hour during each weekday morning and afternoon. On this basis, it is essential that sufficient amount and quality of sidewalk space be provided for pedestrians not only to circulate in the vicinity of the station, but also to fan out in a radial pattern to walk to or from their place of work, residence, or other origin/destination. Today, it is not uncommon for the sidewalk to pinch down to 2m or less. Accordingly, the City should, as a priority, identify opportunities to reduce vehicle lane capacity and/or on-street parking in order to widen sidewalks in the locations shown on Table 5-3.

2. Transform Queen Street into a Transit Showcase Street

The one street that has the greatest short term potential for renewal is Queen Street, which should be a priority. The opportunity is associated with the planned Confederation Line construction, given that two of the three downtown Confederation Line stations (Downtown West and Downtown East) will have station entrances on Queen Street. Demonstration 1 is an excellent starting point to inform the functional design process. Given that there is an opportunity to reconstruct portions of Queen Street during the Confederation Line project implementation, it is important that the street be reconstructed to the enhanced level.

3. Revitalize Rideau Street as a Main Street

Rideau Street presents another short term potential for priority renewal. This is because Rideau Street east of Dalhousie Street has already been redesigned to respond to a more pedestrian, cycling and transit focus, and the construction process has commenced. Also, renewal on the street will occur within the immediate vicinity of the Confederation Line Station construction. For the sector between Dalhousie and Sussex Drive, a functional design has also been completed, and there is a possibility that enhancements can be made in the five-year time frame as a relatively affordable streetscaping project. It is also possible that this section of Rideau Street be revitalized to an enhanced level commensurate with the Downtown Moves Vision upon reconstruction around the Confederation Line stations.

4. Revitalize Albert and Slater Streets

Albert and Slater Streets are recommended as further priorities for renewal. Following opening day of the Confederation Line project, Slater Street will be largely freed of the burden of bus usage as part of the regional Transitway BRT system, and may only serve the less frequent local bus service. Surplus space can be reallocated in a manner that pursues the Downtown Moves Vision. Although Albert Street may still be used as a westbound transit route, its pedestrian environment needs improvement to address transit customers and pedestrian needs. Whereas renewal as rearranged complete streets to an enhanced level in accordance with the Downtown Moves Demonstrations 2, 3 and 4 are suggested as long-term aspirations, it is possible that short term interventions could be advanced immediately. Such interventions might include the introduction of on-street cycling lanes, if appropriate, while retaining the existing curb lines, street drainage, and street lighting infrastructure. A functional design process could be initiated to test this possibility, and to engage stakeholders.

	Vital Move	Long-Term Move and Timing	Extents	Street Renewal Type	Potential Quick Win
A	Secure Wider Sidewalks Near Transit Station Entrances *PRIORITY MOVE*	Widen sidewalks to coincide with opening of Confederation Line	Within transit interface blocks, and block frontages within one crosswalk of the Confederation Line station entrances	Streetscaping	Achieve in part through Confederation Line project, and extend limits via new curbs and sidewalks through lane/parking reductions, and without moving existing street lighting
B	Transform Queen Street into a Transit Showcase Street *PRIORITY MOVE*	Reconstruct as a mobility Showcase Street, ideally to coincide with opening of Confederation Line	Elgin Street to Lyon Street (925m)	Street Surface Rearrangement	Benefit from construction cost savings if coordinated as part of Confederation Line construction
C	Revitalize Albert and Slater Streets *PRIORITY MOVE*	Repurpose as a complete street, following opening of Confederation Line	Elgin Street to Bronson Avenue (1,300m each)	Street Surface Rearrangement	Develop a temporary bike facilities, perhaps through paint markings and temporary curbs or bollards
D	Connect Downtown to Lowertown	"Pedestrianize" intersections, shorten crosswalks and add cycling facilities, as a longer term objective	Intersections of Queen Street at Elgin, and Elgin Street at Wellington, and links between	Street Surface Rearrangement	Sidewalk widenings and crosswalk emphasis, through lane reductions
E	Renew Sparks Street	Resurface/reprogram street surface to enable cycling and to promote street-oriented land uses, as a longer term objective	From Elgin Street to Lyon Street (925m)	Streetscaping	Change regulations to enable cycling on evenings and weekends, to operate as a shared "plaza" street.
F	Complete Inter-provincial Bike Loop	Complete the missing link in an uninterrupted cycling route between Ottawa and Gatineau, as a longer term objective	Wellington Street from Mackenzie Avenue to Portage Bridge, and Mackenzie Avenue from Murray Street to Wellington Street (2,000m total)	Street Surface Rearrangement	Eliminate central turn lane (fifth lane) and rearrange the street with bike lanes along each existing curb
G	Integrate Town and Crown Across Wellington Street	Wrap the streetscaping treatment along Confederation Boulevard one block down the connecting side streets, as a longer term objective	Northernmost blocks of Metcalfe, O'Connor, Kent and Lyon Streets	Streetscaping	Could be completed one street at a time
H	Embellish Metcalfe Street	Distinguish Metcalfe street in Downtown Ottawa as an important civic street linking Parliament Hill to the Museum of Nature	Wellington Street to Gloucester Street (and southerly)	Street Surface Rearrangement	Work with building owners to explore potential streetscape improvements during site redevelopments
I	Connect Downtown to Lebreton Flats	Improve connectivity for cyclists and pedestrians from Albert and Slater Streets across Bronson Avenue, in the escarpment district, timed to serve the needs of planned developments	Bronson Street, Albert Street, and Slater Street, where they intersect	Street Surface Rearrangement	Construction multi-use pathways on lands adjacent to the street right-of-ways

Table 5-4: Potential Vital Moves and Quick Wins

	Vital Move	Long-Term Move and Timing	Extents	Street Renewal Type	Potential Quick Win
J	Enable Through-block Connections Serving the Transit Stations	Provide planning policies that encourage building/land owners to provide mid-block crossings leading to Confederation Line stations, as opportunities arise	In the blocks accommodating Confederation Line stations, and in locations that can join to those routes	Private land modifications	Work with building owners through the development review process to explore their financial benefits, and seek temporary easements on private vacant lands
K	Repurpose Mackenzie King Bridge *PRIORITY MOVE*	Enhance the bridge surface to promote walking and cycling following opening of Confederation Line, and explore weather-protected walkway	Nicholas Street to Elgin Street (500m)	Streetscaping	The enhancements could be delivered as temporary measures (planters, paint markings, etc)
L	Revitalize Rideau Street as a Main Street *PRIORITY MOVE*	Complete the ongoing Rideau Street Renewal capital project to coincide with opening of Confederation Line	Dalhousie Street to Sussex Drive (325m)	Streetscaping	Extend the scope of the ongoing Rideau Street Renewal project, and/or coordinate as part of Confederation Line construction
M	Improve the Mackenzie/ Nicholas/ Waller Intersection	Improve connectivity for cyclists and pedestrians from Sandy Hill and the University of Ottawa to downtown Ottawa and Confederation Line Station. Opportunity for coordination with East-West Bikeway plans	Mackenzie King Bridge, Nicholas Street, and Waller Street, where they intersect. Also includes the north sidewalk along Mackenzie King Bridge, between Waller Street and the overpass over Nicholas Street	Street Surface Rearrangement	Re-use the existing transitway as potential shared use "Plaza" space, through temporary barriers and surface paint markings

Table 5-4: Potential Vital Moves and Quick Wins

5. Repurpose Mackenzie-King Bridge

Improvement to the pedestrian and cycling environment along the Mackenzie-King Bridge (see Demonstration 7) is another short term priority. It is possible that the existing cycling facility could be embellished and protected with temporary planters or perhaps median widening, taking advantage of cross-section width no longer needed exclusively for buses. Additionally, an opportunity to provide a weather protected connection between the National Art Centre and the Ottawa Convention Centre can be explored through collaboration with these facilities and the NCC. Functional design process could be initiated, taking into account potential structural load limitations of the bridge structure.

5.4 Environmental Assessment of the Downtown Moves "Master Plan"

The Class EA process requires the City to identify and mitigate the impacts of large infrastructure projects Infrastructure projects on all aspects of the environment. Ontario's EA requirements for municipal infrastructure projects are addressed through the provisions of the Municipal Engineers Associations (MEA) Municipal Class Environmental Assessment (Class EA), for which there are four (4) classes. Municipal road projects can be described generally as follows:

- Schedule A (normal or emergency operational and maintenance activities, with usually minimal environmental effects)
- Schedule A+ (pre-approved projects, however public is to be advised prior to project implementation)
- Schedule B (generally includes improvements and minor expansions to existing facilities, with some potential for adverse environmental impacts, and requiring the proponent to proceed through a thorough screening process including consultation with those affected)
- Schedule C (generally includes the construction of new facilities and major expansions to existing facilities, for which the proponent is to proceed through the full environmental assessment planning process)

The applicable Class EA provisions are determined by careful review of the "Project Schedules" in the MEA document, specifically the schedule for municipal roads projects. Many of the potential downtown street renewal projects (the segments presented on Table 3) would meet the criteria for a project type #20, which includes:

> *"reconstruction or widening where the reconstructed road or other linear paved facilities (e.g. HOV lanes) will not be for the same purpose, use, capacity or at the same location as the facility being reconstructed (e.g. additional lanes, continuous centre lane)."*

This would apply to any situation where the space acquired for gains to the pedestrian, cycling and transit environment resulted in a reduction in the number of vehicle lanes. For example, if a project involved the reduction of travel lanes and the introduction of on-street cycling facilities, it is likely that such a project will meet this definition due to the change in street "use" and/or the reduction in "capacity" for vehicles, notwithstanding the increase in capacity for cyclists. Each case would need to be assessed individually using sound professional judgement. For Type 20 projects with a construction value exceeding $2.4M (including only the street surface elements, even if municipal services and utilities are being renewed simultaneously), the project would need to proceed as a Schedule C undertaking. If valued less than $2.4M, the project would be a Schedule B undertaking. The cost factors in Table 2 assist in forecasting anticipated construction costs. Note that design and construction services costs are not to be included when assessing project values for Class EA purposes.

There may be some circumstances where streets could be renewed by merely adding streetscaping elements (i.e. a Type 3 project as indicated on Table 3), holding existing curbs and municipal infrastructure in-place. Such projects would meet the criteria for a project type #11 in the MEA document, as "streetscaping (e.g. decorative lighting, benches, landscaping) not part of another project".

As a Master Plan, this document is intended to fulfill the requirements for Phases 1 and 2 of the Municipal Class EA process for road projects. This includes identification of the problem and opportunities, and the selection of the preferred solutions. Phase 1 is completed because the Downtown Moves document effectively identifies the problem/opportunity (to rebalance the distribution of space in downtown street ROWs).

Phase 2 is completed because the Downtown Moves document identifies, evaluates, and selects a preferred solution. The preferred solution established by the Master Plan is the long-term, incremental renewal of downtown Ottawa streets in a manner that addresses the Vision and Strategic Objectives. This plan is fa-

voured over the status quo, which has been determined to be a less-favoured option. The stakeholder consultation requirements of the Class EA planning and design process have also been fulfilled.

One of the specific requirements of Phase 2 of the Class EA process is to identify and evaluate the impacts of the Master Plan (and all projects) on the natural, social, and economic environment of downtown Ottawa. The existing environmental conditions are inventoried in the appendices to the Downtown Moves document. The "Mobility Criteria" provided in Section 3 of this report are used as the primary criteria in this evaluation. The evaluation results are provided on Table 5-5, at right. A "high" rating means that the master plan has a high level of satisfaction in regards meeting the criteria.

This evaluation concludes that the projects included in the Downtown Moves plan will have high ratings in regards to all of the mobility criteria, except two related to vehicle mobility. Pedestrian mobility is augmented through the provision of wider sidewalks supporting higher pedestrian levels of service, and the application of consistent street furnishings and planting. Cycling Mobility is enhanced through the incorporation of bicycle facilities in downtown street right-of-ways, and Transit Mobility is improved through the integration of bus transit service with access points to the Confederation Line system.

Of particular importance to the economic performance of downtown Ottawa is the criterion of 'Optimized Access for Parking, Loading, Tour Buses, and Taxi Stands', under Vehicle Mobility. This criterion recognizes the need for street-edge service spaces on downtown streets to support a variety of higher density land uses such as offices, retail uses, apartments, hotels, institutions, and tourist at-

Mobility Criteria (section 3.1) Criteria Rating: High ● Medium ◑ Low ○		**Status Quo**	**Master Plan Projects**
Pedestrian Mobility	High Pedestrian Level-of-Service	○	●
	Comfortable Sidewalks and Crosswalks	○	●
	Sustainable Planting	◑	●
	A Family of Light Standards, Furnishings and Amenities	○	●
	Clear Signage and Way-finding	○	●
	Pedestrian Connections Between and Through Buildings	◑	●
	Buildings that Create a Visually Stimulating Public Realm	○	●
	A Network of Publicly Accessible Open Spaces	○	●
	Public Art to Add Interest to Pedestrian Environments	◑	●
	Clearly Identifiable Gateways	◑	●
	Integrated Accessibility for All	◑	●
	Pedestrian Easements for Enhanced Pedestrian Mobility	◑	●
Cycling Mobility	An Integrated Network for Bicycle Routes	○	●
	Safe, Prioritized Intersections	○	●
	Plentiful and Easy to Find Bicycle Parking and Amenities	○	●
	Bicycle Sharing Stations at key Locations	◑	●
Transit Mobility	Efficient and Reliable Bus Transit	●	●
	Optimized Connectivity Between All Modes & Confederation Line Stations	○	●
	Improved Integration Between Bus Stops and Bicycle Lanes	○	●
	Enhanced Bus Stop Zones and Amenities	◑	●
Vehicular Mobility	Reduced Traffic Speeds for Safety and Comfort of Other Modes	○	●
	Suitable Access for Parking, Loading, Tour Buses & Taxi Stands	●	●
	Adequate Capacity and Level of Service	●	◑
	Balanced Network of One-way and Two-way Streets	◑	◑
	Safe Interaction Between Vehicle Access Points & Sidewalks	○	●

Table 5-5: Evaluation of Downtown Moves "Master Plan" Projects

tractions. As part of the evaluation entailed by Phase 2 of the Class EA process, it was necessary to determine the impact created by the renewal of downtown streets on street-edge servicing space. The methodology that was used assessed the total block length in the study area available for street-edge servicing, excluding streets where no curb edge space is anticipated (e.g. Wellington St., Rideau St., Bank St., Mackenzie King Bridge, Laurier Avenue Bridge), and took into account the space lost to street space intrusions such as driveways and fire hydrants.

The analysis concludes that there would not be a significant reduction in available street-edge service space if all streets in the study area were reconstructed in the manner anticipated by Downtown Moves. Moreover, the street arrangement promoted by Downtown Moves would create a permanent Street Edge Service Zone along at least one side of most streets, the utilization of which would not be compromised by peak hour traffic restrictions. This may in fact bring increased space for parking/loading/taxi/tour bus activities throughout the day.

The design of the Downtown Moves complete street has paid close attention to the need to keep downtown streets accessible to a range of vehicle types and sizes, including the mobility and accessibility of Emergency Service Vehicles (EMS), city buses, and maintenance vehicles, and delivery trucks. Mobility through intersections has been a particularly important consideration. The curb-to-curb "throat" width of the complete street designs at intersections ranges from 8.55m to 11.8m. Large vehicles including emergency service vehicles and trucks have a width normally not exceeding 2.6m. During a lane blockage or emergency situation, depending on the location of the blocking vehicle/obstacle, the available width could accommodate the simultaneous passage of two large vehicles and a passenger vehicle, even in the minimum width situation.

In terms of the two criteria related to Vehicle Mobility that did not receive a "high" rating ('Adequate Capacity and Level of Service' and 'Balanced Network of One-way and Two-way Streets'), it is acknowledged that the Downtown Moves Master Plan projects would incrementally reduce the space allocated exclusively to vehicles within municipal street right-of-ways, although to an acceptable level and within the context of the City's Transportation Master Plan and Official Plan.

In addition to these fundamental criteria, the master plan has been evaluated as having regard for the Strategic Directions for Downtown Moves as well as the following additional criteria typically used in the completion of Class EA studies:

- Consistency with Planning Policy
- Consistency with Transportation Master Plan
- Compatibility with Adjacent Land Use
- Community Liveability
- Economic Competitiveness
- Tourism
- Heritage Conservation
- Visual Environment
- Noise and Air Quality
- Vegetation
- Surface Water Quality
- Urban Wildlife

On all accounts, the Master Plan and its potential individual projects satisfies the criteria. On the basis of the forgoing, following the acceptance of the Downtown Moves project as an approved Master Plan, projects with potentially higher order impacts (Schedule C Projects including all corresponding street renewal projects)

will be required to complete later phases of the Class EA (Phases 3 – Design Concepts and 4 – Study Report), including required consultation with stakeholders and submission of an Environmental Study Report (ESR) before final design and construction can begin. All other projects (Class A, A+, and B projects) are otherwise approved and only required to fulfill additional consultation or notification requirements (as the case may be) prior to construction.

5.5 Implementation Actions

In addition to fulfilling provisions for the first two phases of the Class EA process, Downtown Moves has identified a wide range of actions that, when implemented as a comprehensive strategy, will enable the long-term, incremental realization of the Vision for downtown Ottawa streets. These actions are grouped as follows:

- Policy and Administrative
- Standards and Guidelines
- Operation and Maintenance
- Programs and Outreach
- Monitoring

A corresponding Downtown Moves Action Plan is provided in table form on Table 5-6. This plan provides guidance in regards the complexity and priority of the action, activities required to initiate and complete the action, and a targeted time frame. It also acknowledges the importance that community associations, business improvement associations and other stakeholders have in contributing to the implementation of this study.

Downtown Moves Action Plan

No.	Recommended Action	Key Activities	Champion				Resources & Complexity Class	Priority	Targeted Timeframe		
			City	Community or Business	Private Sector	Other	High ● Medium ◑ Low ○		0 - 2 years	3 - 5 years	5 years +
A) POLICY & ADMINISTRATIVE CONSIDERATIONS											
	Establish minimum sidewalk width for streets in the Central Area of 3m (including 1.1m furnishing zone, 1.3 m clear zone, and 0.6m building frontage zone)	Include requirements for minimum sidewalk width in Official Plan, TMP and OPP	✔				●	●		✔	
	Add a strong policy statement to the Official Plan based on the Vision and Strategic Directions of the Downtown Moves Report, communicating the City's intention to renew downtown streets to favour the mobility needs and comfort of pedestrians, cyclists, and transit customers, as first priorities.	Amend the Official Plan accordingly, as part of the City's 5-year review	✔				◑	●	✔		
	Modify the current sidewalk easement policy to provide an easement hierarchy and to ensure that the private spaces made available for pedestrian use meet mobility and urban design objectives	Amend the Official Plan, Annex 1 (Road Classification and Rights-of-Way) accordingly, as part of the City's 5-year review	✔				◑	●	✔		
	Incorporate the recommendations for improvements to the on-street cycling network as provided in the Downtown Moves Cycling Vision Plan	Amend the City of Ottawa Cycling Plan in conjunction with its ongoing review, and invest in pilot projects to initiate the implementation of new bicycle facilities	✔				◑	●	✔		
	Establish an updated network of transit priority corridors in downtown Ottawa that reflects planned bus services after the Confederation Line implementation	Update the designation of 'Transit Priority Corridors' in the Official Plan's Rapid Transit Network schedule of the Official Plan, as part of the City's 5-year review	✔			✔	○	●	✔		
	When scoping infrastructure renewal projects involving streets in downtown Ottawa, gain input from City branches and divisions responsible for transportation planning, traffic operations/engineering, community planning and urban design, and development approvals	Include this protocol within the asset management function	✔				○	○		✔	
	When conducting planning and design projects for infrastructure involving downtown streets, establish collaborative working groups involving both technical/staff, community planning/design staff and community stakeholders	Include this protocol in project terms of references	✔	✔			○	●	✔		

Table 5-6: Downtown Moves Action Plan

No.	Recommended Action	Key Activities	Champion				Resources & Complexity Class	Priority	Targeted Timeframe		
			City	Community or Business	Private Sector	Other	High ● Medium ◑ Low ○		0 - 2 years	3 - 5 years	5 years +
	Conduct a functional planning/design process for downtown street renewal projects prior to initiating detailed design assignments	When scoping projects, determine the need or not for this "two-stage" planning and design process. Conduct the functional planning/design either as a component of the EA process when required, or as part of an area planning exercise where applicable	✔				◑	◑		✔	
	Create a decision-making mechanism at the Manager level, involving transportation planning, traffic engineering/operations, and community planning and urban design, to be used when street planning/design processes require a decision on functional design solutions	Explore the possibility of a "street design decision-making" body, consisting of managers within the administration	✔				◑	◑		✔	
	Gain input from the City's Urban Design Review Panel on significant downtown street infrastructure projects	Confirm this requirement in the Panel's mandate, and provide an opportunity for the project to be presented at the functional design and the detailed design stages	✔				◑	○	✔		
	During development review processes include, as a condition of approval, that the adjacent street sidewalk zone be analysed based on future pedestrian levels of service and that it be reconstructed	Include specific conditions in the Site Plan Agreement and ensure the City receives accurate estimate of costs for the reconstruction of adjacent street sidewalk	✔				○	●	✔		
	Implement a co-ordinated downtown system of mid-block connections in order to facilitate travel to and from Confederation Line stations	Through the development approval process, work with developers to include designs for mid-block connections	✔				◑	◑			✔
B) STANDARDS AND GUIDELINES											
	Develop a set of urban streetscape standards addressing matters such as street tree planting, street light types and offsets, surfaces, and all street furnishings	Implement streetscape standards through development review or capital works projects	✔				◑	◑		✔	
	Establish a detailed building façade improvement strategy and guidelines for the Central Area, focusing on creating pedestrian priority streetscapes	Undertake a detailed façade improvement study	✔				◑	◑		✔	
	Along the bus/Confederation Line interface blocks, establish design standards for sidewalks to provide sufficient width and capacity for the high volumes of pedestrians expected	When Confederation Line station locations are determined, evaluate the pedestrian capacity requirements of pedestrian routes linking bus stops to the stations in conjunction with OC Transpo	✔			✔	◑	●		✔	
	Identify priority bus transit stops and pursue a appropriate space along the street edge to enable the installation of amenities for patrons, including shelters	OC Transpo to progress with its post-Confederation Line bus transit plan, identify bus stops, develop design standards for bus stop design, and pursue street edge space	✔			✔	◑	◑		✔	
	Develop an integrated family of street lights and street furnishings that have regard for the Downtown Move street typology	Review the City's Street Lighting Policy, and establish a new street furnishing program focused on downtown	✔				◑	◑		✔	

Table 5-6: Downtown Moves Action Plan

No.	Recommended Action	Key Activities	Champion				Resources & Complexity Class	Priority	Targeted Timeframe		
			City	Community or Business	Private Sector	Other	High ○ Medium ◗ Low ○		0 - 2 years	3 - 5 years	5 years +
D) OPERATION AND MAINTENANCE											
	Acknowledge that streets with more complex and finer above-grade infrastructure will require more duty of care in maintenance	Provide appropriate operating and maintenance budgets	✔			✔	○	●	✔		
	Develop a standardized set of street infrastructure components (street lights, furnishing, paver stones, etc) in downtown Ottawa, where practical, to reduce inventory costs	Identify components that may be appropriate for standardization	✔			✔	○	●	✔		
	Review the existing Tour Bus on-street parking, loading and pick-up/drop-off zones in downtown Ottawa and develop a cohesive strategy to address Tour Bus parking considerations	Create a working group composed of representatives from the City of Ottawa's Parking Operations, Maintenance & Development department, the NCC and BIAs	✔			✔	○	◑		✔	
	When streets are renewed, prepare an "operating and maintenance manual" that itemizes the project's design details and materials	Include this requirement in the terms of reference for the consulting design assignment	✔			✔	○	●	✔		
E) PROGRAMS AND OUTREACH											
	Expand the pedestrian count program to include mid-block pedestrian counts and at all crossings	Identify priority streets where counts most informative. Provide counts to inform all street infrastructure planning/ design projects	✔				○	○	✔		
	Develop and implement pedestrian-priority pilot projects that will enable high pedestrian level-of-service	Establish a pilot project working group to identify opportunities, develop, implement and monitor projects	✔			✔	◑	●	✔		
	Develop and deliver a wayfinding strategy focussed on pedestrian and cyclist navigation to the Confederation Line stations and destinations of civic and capital importance	Collaborate with the NCC, BIAs, and the Confederation Line operators in the program design	✔		✔		○	◑		✔	
	Establish a street food vendor program that promotes street activity and active transportation	Review the City's recently approved program to ensure consistency with the Downtown Moves Vision		✔			○	○	✔		
	Promote the expansion of public art in the Central Area	Review the current public art program, and contemplate appropriateness of extending the requirement to private sector projects	✔		✔		◑	○	✔		
	Establish a street beautification program for all downtown streets that engages the NCC, business and community associations, and individual owners	Establish a working group to determine the criteria and funding for this program	✔		✔		○	◑		✔	
	Expand the Bixi bike sharing program with new locations oriented to users of the Confederation Line	Collaborate with the NCC to identify viable new locations near Confederation Line access points	✔			✔	○	◑		✔	

Table 5-6: Downtown Moves Action Plan

No.	Recommended Action	Key Activities	Champion				Resources & Complexity Class	Priority	Targeted Timeframe		
			City	Community or Business	Private Sector	Other	High ● Medium ◑ Low ○		0 - 2 years	3 - 5 years	5 years +
	Provide training and capacity building to City staff, community associations, BIAs and other stakeholders to promote the objectives of Downtown Moves	Develop a training program and liaise with all potential stakeholders	✔	✔	✔	✔	○	●	✔		
F) MONITORING											
	Ensure that amenities at downtown transit stations and bus stops adequately serve the requirements of transit customers	Monitor the level of downtown bus service after the commencement of Confederation Line service, and survey users	✔			✔	○	○			✔
	Ensure that the rationalized on-street parking supply is provided for the needs of downtown businesses and residents	Update the Central Area parking study after the commencement of Confederation Line service	✔				○	○			✔
	Review the Downtown Moves plan every five years, at the time of Official Plan Review	Include the Downtown Moves plan review as work item	✔				◑	◑			✔

Table 5-6: Downtown Moves Action Plan